

ADDENDUM

DRAFT ENVIRONMENTAL IMPACT REPORT
ER 88-11

Beaconsfield Homes
17-Unit Single-Family Development
Beaconsfield Place

October, 1989

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Planning and Environmental Research
1226 Warner Court
Lafayette, CA 94549



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I.

INTRODUCTION

The Draft Environmental Impact Report (DEIR) on the proposed Beaconsfield project was completed during June, 1989, and the City Planning Commission held a public hearing on the DEIR on August 6, 1989. During the public review period, the City received numerous written comments on the DEIR, from project-site neighbors. Based on concerns expressed in these comments, and on testimony taken during the August 6 public hearing, the City determined that additional information would be needed in order to allow concerned parties an opportunity for more thorough environmental review of the proposed development. The required additional information, which is the subject of this addendum, was the following:

1. A grading plan. (The submitted grading plan includes a revised proposal for retaining walls.)
2. A plan for "secondary drainage" (drainage systems for individual lots and units).
3. A landscaping plan.

A letter from the City's Planning Director to the project applicant, stating the requirement for additional information and outlining the schedule for continued environmental review of the project, is contained in Appendix A. In summary, the schedule calls for public distribution of this addendum beginning on October 9, 1989; a public hearing on the addendum on October 18; preparation of responses to comments on the DEIR and the Addendum, after October 19; distribution of the Final EIR (FEIR) beginning on November 22 (tentative); and a public hearing on the FEIR on November 29 (tentative). The FEIR will consist of the DEIR, the Addendum, and responses to comments (written and public testimony) on both documents.

II.

FORMAT AND PRESENTATION OF GRADING AND DRAINAGE PLANS

In response to the requirement for additional information, the applicant has prepared the grading and drainage plan in the form of the preliminary grading plan which he expects to submit for City review in conjunction with an application for a grading permit. This submittal consists of four 42" x 30" sheets, each depicting a quadrant of the project site, drawn at a scale of 1" = 10'. This set of drawings includes the proposed plans for house foundations, retaining walls, primary and secondary drainage, and grading, including street alignment and grades. Existing and proposed features are shown on a topographic/boundary survey-map surveyed by a licensed land surveyor. Proposed grading, drainage, and other development features were designed by the applicant's civil engineer. The plans provide a substantial level of engineering detail, consistent with the information required by the City, and normally required in other jurisdictions, for the purpose of obtaining grading and development permits.

In order to accommodate the applicant's plans in this addendum, each plan sheet has been photographically reduced to a scale of 1" = 30', and the reduced plans are presented as Figures 4-A through 4-D. Figure 1 is a key map, showing the quadrant of the project site covered by each of the four detailed plan sheets. In order to help

the reader understand the earthwork which is shown on the detailed plans, Figure 2 illustrates the approximate boundary of the proposed area of project-site fill. Proposed earthwork beyond the boundary of the fill area consists of cutting, either below the alignments of the proposed retaining walls or for house foundations. It is proposed that material excavated from the project-site slopes be used as engineered fill along the canyon floor, so that earthwork is balanced on-site. (Note: Some of the reduced grading/drainage plans shown as Figures 4-A through 4-D have dark, blotchy areas on dwelling-unit driveways. These areas, which do not obscure any important, overall details of the plans, occurred as a result of photographic reduction of areas which were shaded on the original drawings.)

In addition to the four sheets of grading/drainage plans, the applicant has prepared a set of sample site-sections, showing two cross-sections through the site and a roadway/fill section (profile). These sections are shown on Figure 3. (Prints of the full-scale grading/drainage plans and the site-sections plan are available for public review at the City of Oakland's Planning Department office.)

III.

PROPOSED GRADING (Figs. 1, 2, 3, and 4-A through 4-D)

In the DEIR, project geology, soils, seismicity, and grading are described on pages 30-45, and impacts and mitigation measures are discussed on pages 78-80. The submitted grading plans contained in this addendum provide the following information:

Earthwork Volume. Based on the detailed grading plans, the project civil engineer has revised the estimate of earthwork volume from 12,000 cubic yards to 15,000 cubic yards. This revision is attributed to more accurate calculation of volume rather than to any major change in project design. That is, project design is essentially the same as described in the DEIR, but preparation of the detailed grading plan has allowed more accurate calculation of earthwork volume.

Locations of Improvements. The project street, house foundations, retaining walls, and other improvements are in the same locations, in plan view, as indicated on plans discussed in the DEIR.

Depth of Fill. In the DEIR, the preliminary project-roadway plan/profile and roadway cross-sections indicated that anticipated depth of canyon-floor fill was up to a maximum of 18 to 20 feet (DEIR, Figs. 17-A and 17-B, pp. 21-22). However, on the basis of the detailed grading plan, the maximum depth of fill would be on the order of 14 feet, about four to six feet less than previously anticipated.

Roadway Gradient. The preliminary project-roadway plan/profile, referenced above, indicated that the new project street would have a maximum gradient of 20% at the west end of the street. The detailed grading plan, however, indicates that the maximum gradient along the westerly 80 feet of the street would only be 16%, the second 100 feet of roadway would have a maximum gradient of about 10%, and beyond that, the gradient would be about 7%, up to the cul-de-sac turnaround area, which would be nearly level. The 16% gradient is consistent with the Office of Public Works recommendation for maximum project-site roadway gradient.

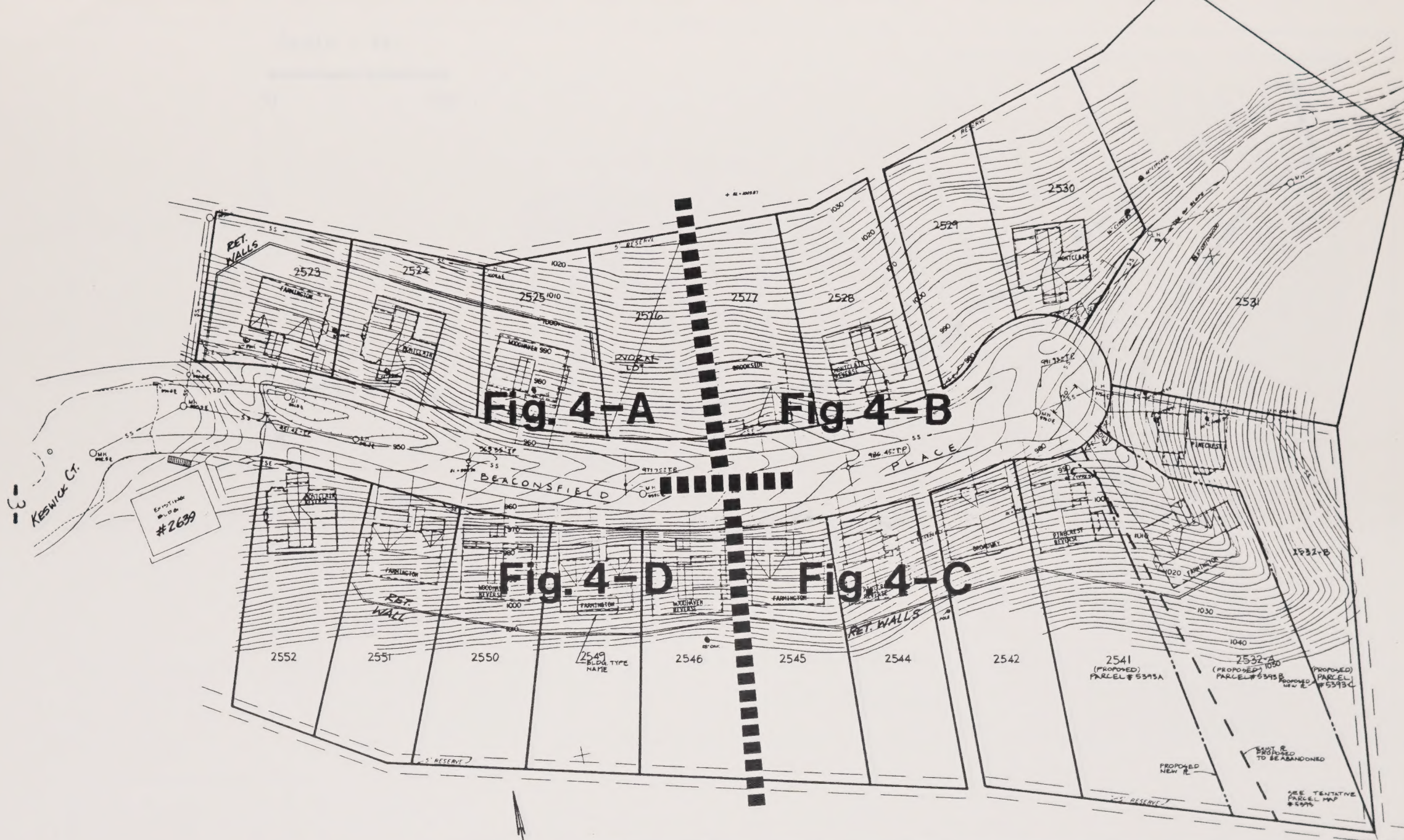


Figure 1.

KEY MAP - GRADING/DRAINAGE PLAN

Each sheet of the plan set covers one quadrant of the project site.

Scale - Ft.

0 100

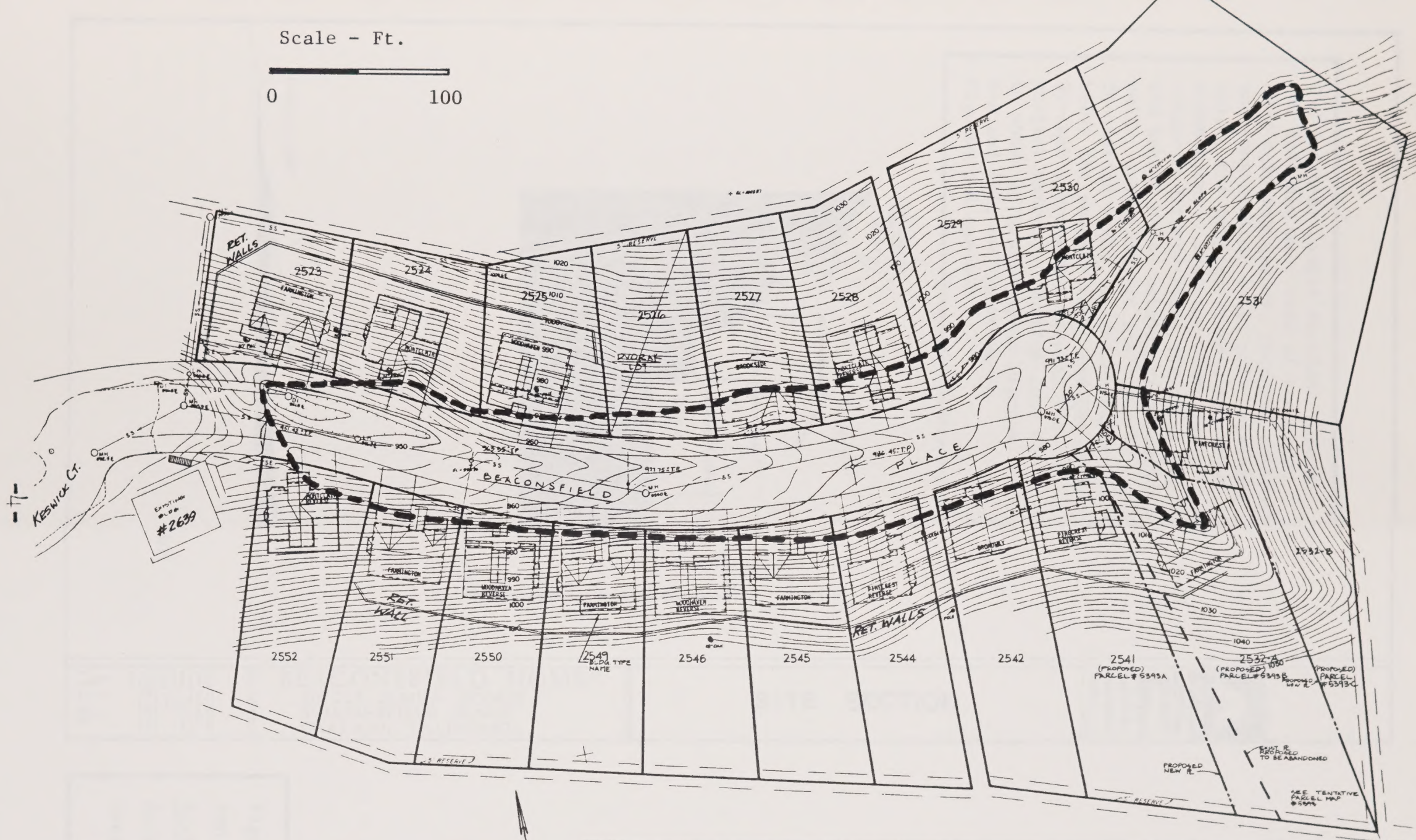
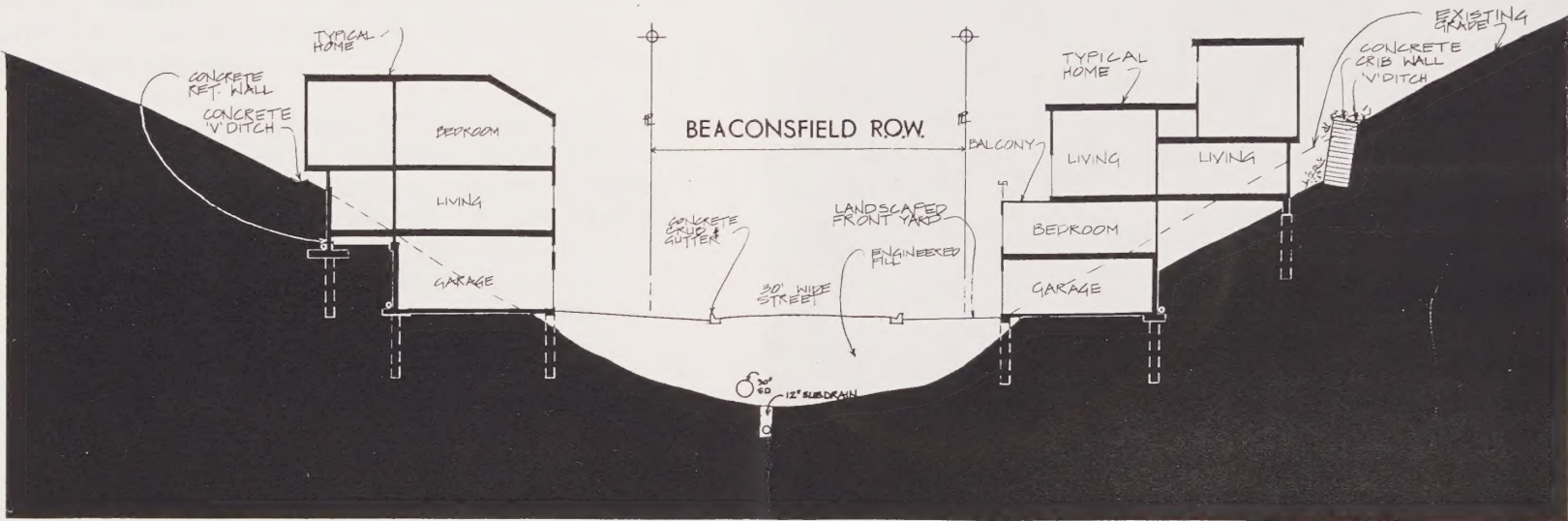


Figure 2.

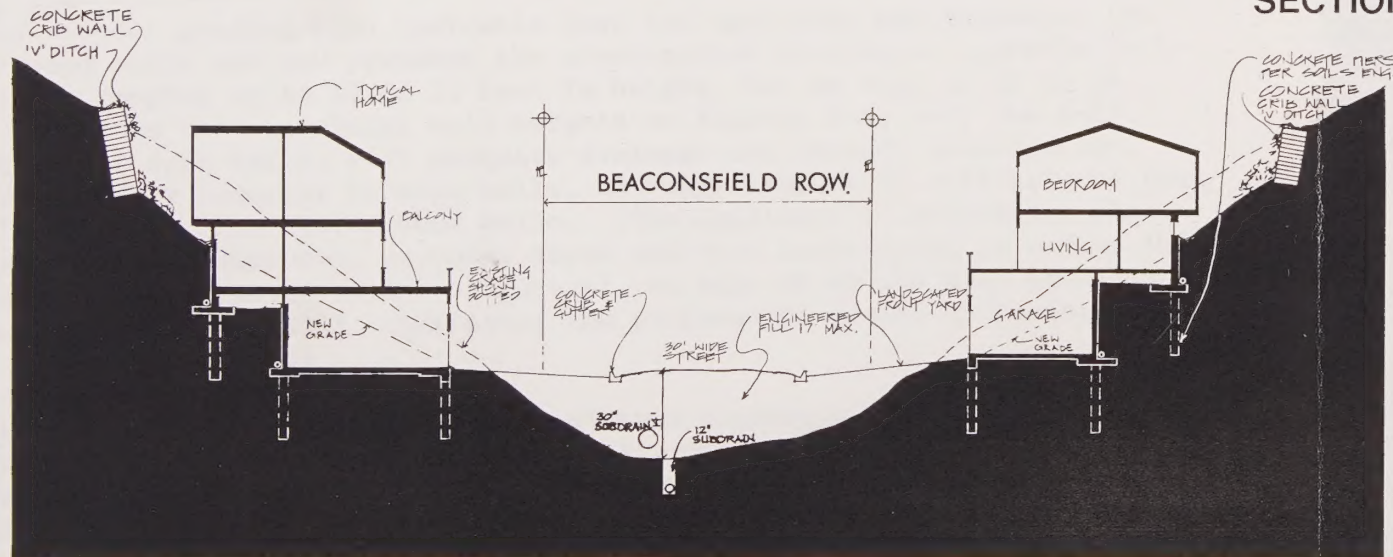
APPROXIMATE PROJECT-SITE FILL AREA

Dashed line shows approximate boundary of proposed fill area, based on submitted preliminary grading/drainage plan. Grading beyond the boundary of the fill area would consist of cutting, either below the alignments of the proposed retaining walls or for house foundations.

C-C and B-B, sample sections through the east and west ends of the site, show existing grades, proposed cutting and canyon-floor fill, crib retaining walls, the project street, and house foundations. Drainage shown includes concrete ditches above retaining walls and behind house retaining/foundation walls, sub-drains at the bases of foundation walls, a 12-inch sub-drain below the roadway fill, and the main 30-inch storm drain beneath the project street. (Section line B-B is shown on grading-plan Figures 4-A and 4-D; C-C is shown on Figures 4-B and 4-C.)

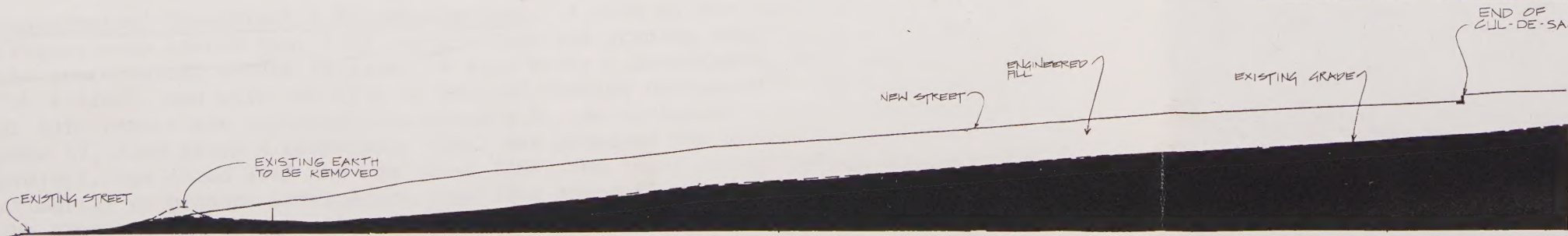


SECTION C-C



SECTION B-B

Section A-A is a roadway profile along the proposed project street, showing the existing canyon-floor grade and the proposed fill and new street grade. The end of existing Beaconsfield Place is shown at the left and the end of the proposed street is shown at the right. Maximum depth of fill would be approximately 14 feet. Maximum roadway gradient would be 16%, at the west end of the project street.



SECTION A-A

GRADING PLAN &
PRIMARY / SECONDARY
DRAINAGE PLAN

ARCHITECTS &
GENERAL CONTRACTORS
2274 COMMENCE AVE.
OAKLAND, CALIFORNIA
94612
ISSUED FOR PERMIT:
ISSUED FOR BIDS:
ISSUED FOR CONST:
REVISED: 9-26-87

SITE SECTION

BEACONSFIELD HOMES
SINGLE FAMILY HOMES
BEACONSFIELD PLACE
OAKLAND, CALIFORNIA

Date 7-7-88
Scale 1"=10'-0"
Drawn DT
SITE WORK
Sheet

A1.6

Figure 3.
PROJECT-SITE SECTIONS
Scale:
Section A-A: 1" = 60'
Sections B-B & C-C:
1" = 30'

Earthwork at Project Entrance. In the DEIR, concern was expressed regarding possible adverse earthwork impacts on the property at 2639 Beaconsfield Place, on the south side of the street, at the west project boundary. The submitted grading plan, however, indicates that roadway earthwork in this area would be relatively minor and would be conducted within the public right-of-way.

Retaining Walls. As discussed in the DEIR, the applicant's proposal for retaining walls on slopes above 12 of the proposed houses was for pairs of tiered, pressure-treated wood walls, each with a height of up to six feet, with maximum, total height of about 13 or 14 feet between the bottom of the lower wall and the top of the upper wall (see DEIR Figures 6 and 7, pp. 8 and 9; and Figure 25, p. 44). The DEIR expressed concern about the relatively short life-expectancy and potential stability and long-term maintenance problems associated with wood walls, and suggested that a single, permanent, concrete wall would be superior because it would have a longer life, with little or no maintenance, would be expected to yield better foundation conditions (i.e., deeper below the surface) than a tiered arrangement, and would be more straightforward in its design and construction. One such alternative is the concrete crib-wall which is shown on Figures 41 and 42, pages 88 and 89, of the DEIR.

The submitted project grading plan indicates that the applicant has abandoned the proposal for wood walls and now proposes the construction of single, concrete crib-walls, generally ranging up to 10 or 12 feet in height, but as high as 13 to 14 feet in two locations (see retaining wall heights on Figures 4-A, 4-C, and 4-D). It is expected that such walls, with adequate drainage and careful construction, would be substantially superior to wood walls, although they would initially be less aesthetically pleasing than tiered wood walls. (The applicant's landscaping plan, discussed later in this addendum, proposes shrub and vine landscaping to reduce the visual impacts of the proposed walls. Figure 41, on page 88 of the DEIR provides sample photographs of crib walls, indicating how progressive growth of landscaping can provide visual screening.)

Graded Slopes. The submitted grading plan indicates maximum cut slopes at 2:1 gradient (two feet horizontal to one foot vertical, or 50%). Below the proposed retaining walls, side-yard slopes at 2:1 would generally be about 30 feet in vertical height, but would range up to around 40 feet. The plan also shows proposed locations and heights of foundation/retaining walls for houses, which would support vertical slope-cuts.

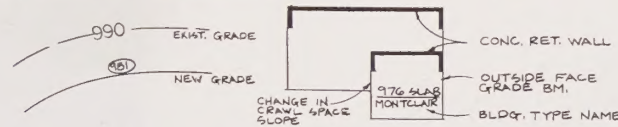
Geotechnical Consultant's Recommendations. A note on the submitted grading plan (Figure 4-A) states that "All construction and grading shall be in accordance with the geotechnical report prepared by Alan Kropp & Associates, dated January 5, 1988, Job # 414-7, and with the City of Oakland Grading Ordinance." The recommendations of this report are contained in Appendix B. As indicated in the DEIR, beginning on page 37, Alan Kropp & Associates (AKA) has prepared two geotechnical reports for the project, one dated 1988 and one dated 1989, the later report having been prepared primarily to present information regarding sub-surface conditions in the areas of the proposed retaining walls. The recommendations from the 1989 AKA report are contained in Appendix F of the DEIR. The DEIR has proposed that the applicant's geotechnical consultant review the project grading plan to provide assurance that proposed development is consistent with all applicable recommendations of both the 1988 and 1989 AKA reports. (Both reports are available for public review at the City of Oakland Planning Department office.)

GENERAL NOTES FOR DETAILED SITE PLANS

1. ALL GARAGE SLAB ELEVATIONS ARE TAKEN AT THE REAR OF GARAGE. THE ELEVATION AT GARAGE ENTRANCE IS 4' LOWER.

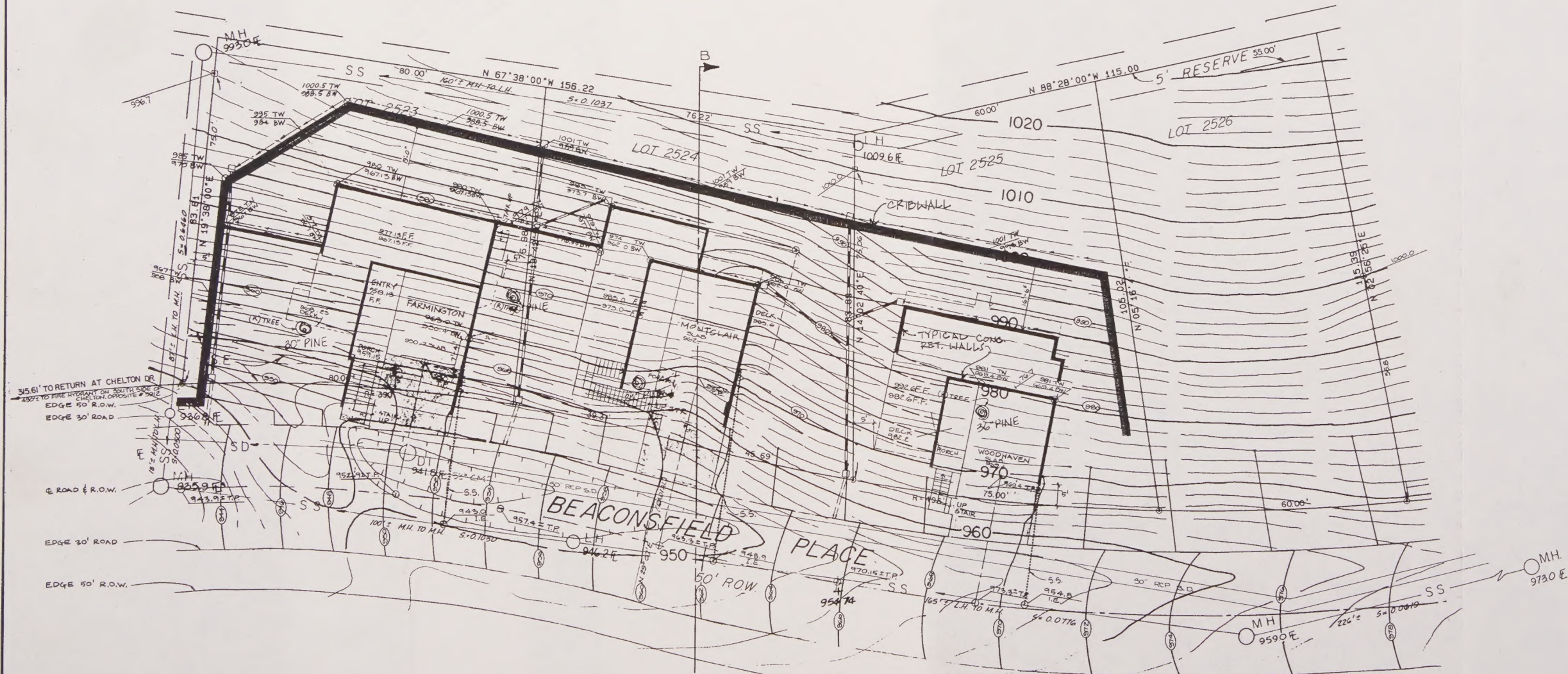
2. ALL SPOT GRADES SHOWN THUS ∇_{960} ARE NEW EARTH GRADES UNLESS NOTED 'T.S.' OR 'T.P.' OR 'T.C.' ETC

LEGEND FOR DETAILED SITE PLANS



NOTES:

1. ALL CONSTRUCTION AND GRADING SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT PREPARED BY ALAN KROPP & ASSOCIATES, DATED JANUARY 5, 1988, JOB # 414-7, AND WITH THE CITY OF OAKLAND GRADING ORDINANCE.
2. ALL AREAS OF CUT, AND AREAS WHERE EXISTING VEGETATION APPEARS TO PROVIDE INADEQUATE SLOPE PROTECTION, A JUTE HESH OR EXCELSTON MATTING SHALL BE INSTALLED OVER A PREPARED SEED BED.
3. CONNECT ROOF DOWNSPOUTS TO CLOSED PIPE SYSTEM.
4. DURING THE RAINY SEASON, OCTOBER 15 TO APRIL 15, PROVIDE AND MAINTAIN A STRAY-SALE DIKE AS PER A.S.A.G. STANDARD EROSION & SEDIMENT CONTROL MEASURES ACROSS THE BEACONSFIELD PLACE RIGHT OF WAY AT THE WESTERLY LIMITS OF GRADING.



ALL GRADES AND CONTOURS ARE BASED ON CITY OF OAKLAND DATUM.

HORIZONTAL AND VERTICAL CURVES EXIST WITHIN 300' OF PROPOSED DRIVEWAY.

APPROXIMATE EARTHWORK VOLUMES

FILL - 15,000 CU YD
CUT - 15,000 CU YD

---	CONCRETE LINED SWALE
□	CATCH BASIN
---	STORM DRAIN
---	3" PIPE THROUGH CURB
□	SET HUB & TACK
○	SET REBAR & CAP, L.S. 4961
○	S.E. SLOPE EASEMENT
S.D.E.	STORM DRAIN EASEMENT
S.S.	SANITARY SEWER
M.H.	MANHOLE
L.H.	LAMPHOLE
T.W.	TOP OF WALL
B.W.	BASE OF WALL
---	PROPOSED CONTOURS
---	EXISTING CONTOURS



Robert J. Bernal 11-11-88

SURVEYOR'S CERTIFICATE: THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN CONFORMANCE WITH THE REQUIREMENTS OF THE LAND SURVEYOR'S ACT AS THE RESULT OF ED. 10/10/87 ON NOVEMBER 11, 1987.

I HEREBY STATE THAT ALL PROVISIONS OF APPLICABLE STATE LAWS AND LOCAL ORDINANCES HAVE BEEN COMPLIED WITH.
I FURTHER STATE THAT THE PARCEL DELINEATED UPON THIS SURVEY IS THE SAME AS THAT SHOWN ON THE CURRENT EQUALIZED COUNTY ASSESSMENT ROLL AS A UNIT.
X AS CONTIGUOUS UNITS.

GRADING PLAN & PRIMARY / SECONDARY DRAINAGE PLAN

LOTS 2523, 2524, 2525 AND 2526
PIEDMONT PINES (14 M. 40-43)
CITY OF OAKLAND, ALAMEDA COUNTY, CALIFORNIA

MORAN ENGINEERING
463 KENTUCKY
BERKELEY, CA 94707
(415) 527-7744

SCALE 1" = 10'
87-1768

JANUARY, 1988
GRADING SEPTEMBER 1989
FB 334

BEACONSFIELD HOMES
SINGLE FAMILY HOMES
BEACONSFIELD PLACE
OAKLAND, CALIFORNIA

DATE 2-2-88
SCALE 1" = 10'-0"
DRAWN JF
SHEETWORK
A1.2

Figure 4-A.

GRADING/DRAINAGE PLAN

Northwest quadrant of project site.

Scale: 1" = 30'

---	CONCRETE LINED SWALE
□	CATCH BASIN
---	STORM DRAIN
---	5" PIPE THROUGH CURB
⊕	SET HUB & TACK
⊙	SET REBAR & CAP, L.S. 4961
S.E.	SLOPE EASEMENT
S.D.E.	STORM DRAIN EASEMENT
S.S.	SANITARY SEWER
M.H.	MANHOLE
L.H.	LAMP HOLE
T.W.	TOP OF WALL
B.W.	BASE OF WALL
---	PROPOSED CONTOURS
1000	EXISTING CONTOURS

ALL GRADES AND CONTOURS ARE BASED ON CITY OF OAKLAND, DATUM.

HORIZONTAL AND VERTICAL CURVES EXIST WITHIN 300' OF PROPOSED DRIVEWAY.

SEE SHEET A1.2 FOR NOTES

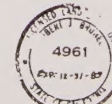


BEACONSFIELD HOMES
 SINGLE FAMILY HOMES
 BEACONSFIELD PLACE
 OAKLAND, CALIFORNIA

GRADING PLAN & PRIMARY / SECONDARY DRAINAGE PLAN

LOTS 2527, 2528 AND 2530
 PIEDMONT PINES (14 M. 40-43)
 CITY OF OAKLAND, ALAMEDA COUNTY, CALIFORNIA

MORAN ENGINEERING
 463 KENTUCKY
 BERKELEY, CA. 94707
 (415) 527-7744



SCALE 1" = 10'
 JANUARY 1988
 GRADING SEPTEMBER 1989

Figure 4-B.
 GRADING/DRAINAGE PLAN
 Northeast quadrant of project site.
 Scale: 1" = 30'

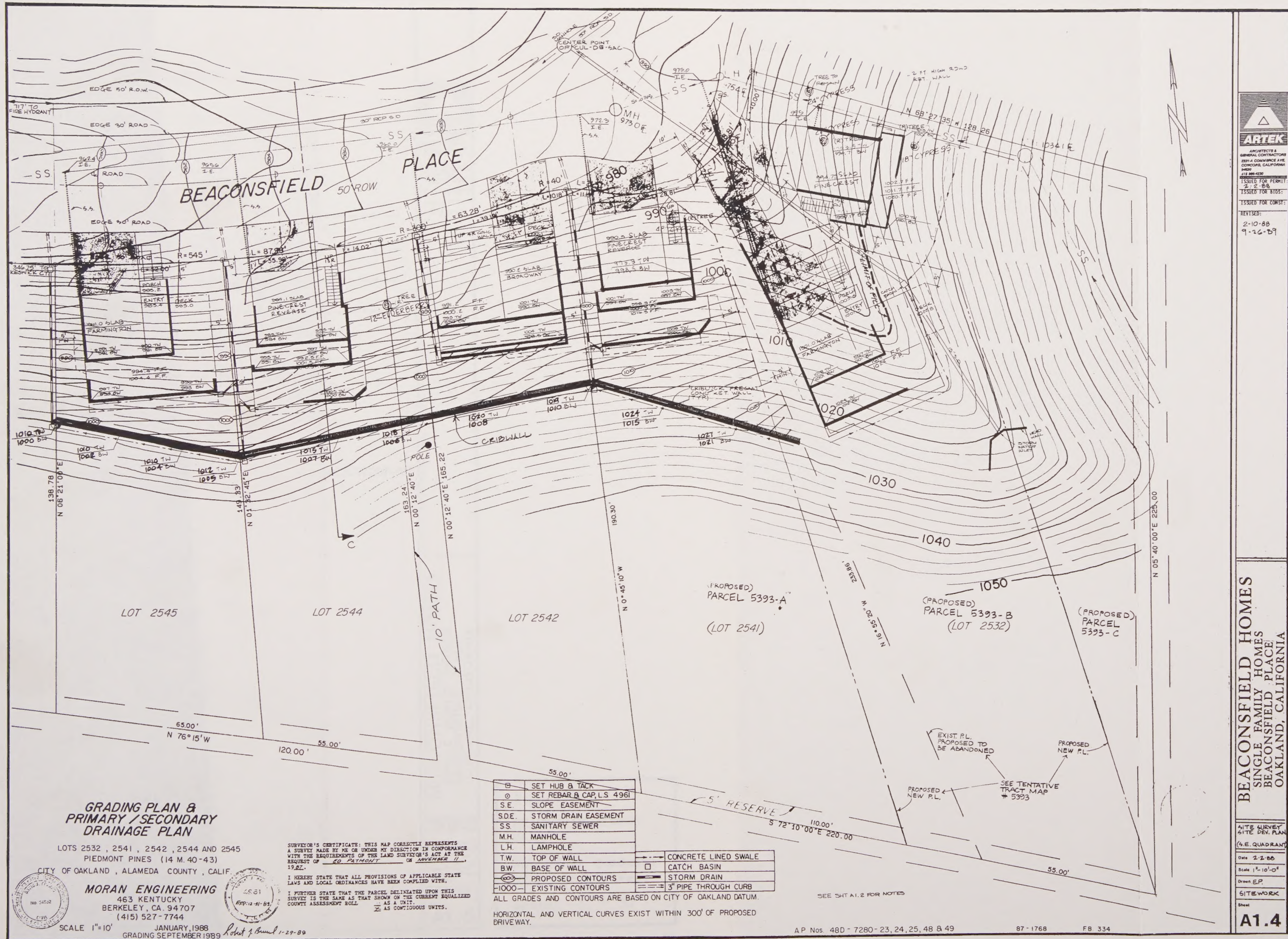


Figure 4-C.

GRADING/DRAINAGE PLAN

Southeast quadrant of project site.

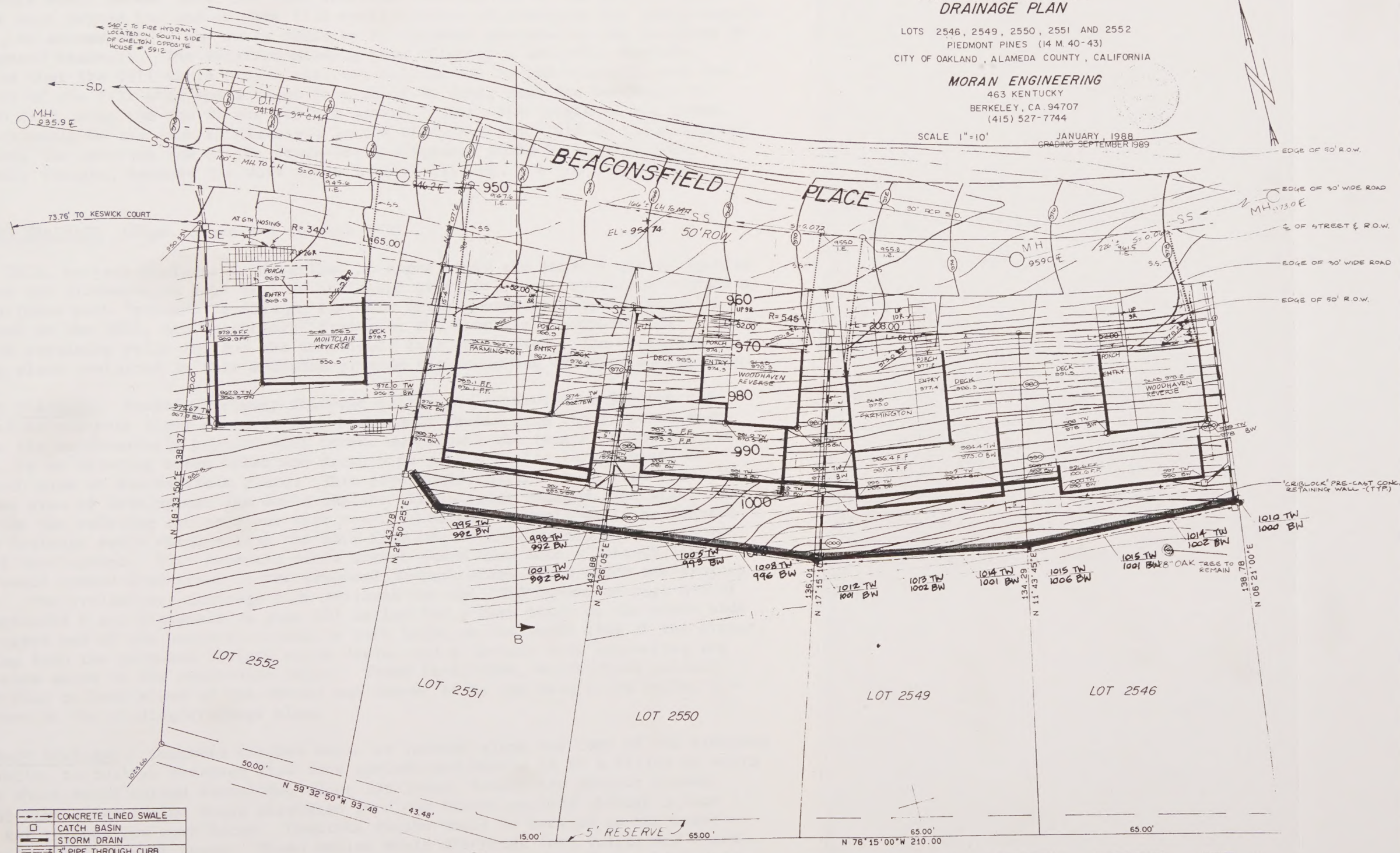
Scale: 1" = 30'

GRADING PLAN & PRIMARY / SECONDARY DRAINAGE PLAN

LOTS 2546, 2549, 2550, 2551 AND 2552
PIEDMONT PINES (14 M. 40-43)
CITY OF OAKLAND, ALAMEDA COUNTY, CALIFORNIA

MORAN ENGINEERING
463 KENTUCKY
BERKELEY, CA. 94707
(415) 527-7744

SCALE 1"=10' JANUARY, 1988
GRADING SEPTEMBER 1989



CONCRETE LINED SWALE	1000-
CATCH BASIN	
STORM DRAIN	
3" PIPE THROUGH CURB	
SET HUB & TACK	
SET REBAR & CAP, L.S. 4961	
S.E. SLOPE EASEMENT	
S.D.E. STORM DRAIN EASEMENT	
S.S. SANITARY SEWER	
M.H. MANHOLE	
L.H. LAMPHOLE	
T.W. TOP OF WALL	
B.W. BASE OF WALL	
PROPOSED CONTOURS	
EXISTING CONTOURS	

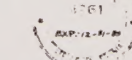
ALL GRADES AND CONTOURS ARE BASED ON
CITY OF OAKLAND DATUM.

HORIZONTAL AND VERTICAL CURVES EXIST
WITHIN 300' OF PROPOSED DRIVEWAY.

SEE SHEET A1.2 FOR NOTES

SURVEYOR'S CERTIFICATE: THIS MAP CORRECTLY REPRESENTS
A SURVEY MADE BY ME OR UNDER MY DIRECTION IN CONFORMANCE
WITH THE REQUIREMENTS OF THE LAND SURVEYOR'S ACT AT THE
REQUEST OF ED PATMONT ON NOVEMBER 11, 1982.

I HEREBY STATE THAT ALL PROVISIONS OF APPLICABLE STATE
LAWS AND LOCAL ORDINANCES HAVE BEEN COMPLIED WITH.
I FURTHER STATE THAT THE PARCEL DELINEATED UPON THIS
SURVEY IS THE SAME AS THAT SHOWN ON THE CURRENT EQUALIZED
COUNTY ASSESSMENT ROLL AS A UNIT.
X AS CONTIGUOUS UNITS.



Ed Patmont 1-29-83

BEACONSFIELD HOMES
SINGLE FAMILY HOMES
BEACONSFIELD PLACE
OAKLAND, CALIFORNIA

SITE SURVEY
SITE DEV. PLAN
(S.W. QUADRANT)
Date 2-2-88
Scale 1"=10'-0"
Drawn EP
SITE WORK
Sheet
A1.5

Figure 4-D.

GRADING/DRAINAGE
PLAN

Southwest quadrant
of project site.

Scale: 1" = 30'

Creek-Area Fill. Based on project plans reviewed for the DEIR, it was estimated that the area of fill to be placed in the creek which enters the northeast corner of the site would extend about 100 feet upstream from the end of the project road, and that work beyond the end of this fill would consist of trenching for approximately 80 feet, to accommodate a new storm drain to be extended upstream to the location of the proposed headwall. The detailed grading plan (Figures 2 and 4-B), however, indicates that the fill would extend upstream all the way to the headwall, and that the width of the fill area would range from about 40 feet, near the headwall, to about 80 feet, near the end of the project street. Thus, the length of the creek earthwork would be the same as discussed in the DEIR, but the width of the disturbed area along the upstream end of the storm-drain alignment would be greater than previously thought, because the work would involve filling, not just trenching.

IV.

PROPOSED DRAINAGE (Figs. 3 and 4-A through 4-D)

In the DEIR, project drainage is described on pages 45-49 and impacts and mitigation measures are discussed on page 81. As indicated previously, the applicant's grading plan includes both "primary" drainage, the main drainage-system proposal which is addressed in the DEIR, and "secondary" drainage, the specific system for the proposed retaining walls and for the individual lots and houses. The submitted grading plans contained in this addendum provide the following drainage information:

Primary Drainage. Proposed primary drainage facilities consist of a 30-inch RCP (reinforced concrete pipe) storm drain, which would extend from the proposed headwall in the northeasterly project-site creek, underneath the length of the project street, to an existing storm inlet and drain pipe just off-site to the west, on the north side of Beaconsfield Place. This pipe would collect creek flow above the proposed area of development and would replace the existing damaged pipe which runs alongside the existing canyon-floor dirt road. A second headwall would be located in the drainage swale which enters the site from the southeast, above the proposed area of development. This headwall would direct storm flow into a 15-inch pipe which would extend downstream to the proposed 30-inch storm drain under the project street. The preliminary drainage plan reviewed for the DEIR (shown on page H-4 of DEIR Appendix H and discussed on page 48) called for a curb inlet on the south side of the west end of the proposed street, a curb inlet on the north side of the street, draining into the proposed 30-inch storm drain, and a 12-inch pipe connecting the south-side inlet to the north-side inlet. These facilities, which would collect gutter flow on both sides of the street and convey it to the main storm drain, are not shown on the grading/drainage plan.

Secondary Drainage. Concrete ditches would be located along the tops of the proposed crib walls, to collect overland flow from upslope and convey it to a series of storm drains which would extend downslope, along lot lines, toward the project street. The lot-line storm drains would discharge into the street gutters through 3-inch pipes set through the curb faces. Concrete swales would be located at the upper foundation wall of each house. These swales would discharge into inlets and storm drains which, in turn, would discharge into the lot-line storm drains mentioned above, so that this flow would also be conveyed to the street gutters. Note #2 on the first sheet of grading plans (Figure 4-A) indicates that roof downspouts will be connected to a closed pipe system. The plan of site sections (Figure 3) shows subsurface drain pipes at the bases of upslope house-foundation walls.

Roadway-Fill Sub-Drain. The submitted site-section plan (Figure 3) shows a proposed 12-inch sub-drain below the base of the proposed canyon-floor fill. This drain is in conformance with the recommendations of the applicant's Alan Kropp & Associates geotechnical reports.

Erosion Control. Notes on the first sheet of grading plans (Figure 4-A) state that "All areas of cut, and areas where existing vegetation appears to provide inadequate slope protection, a jute mesh or excelsior matting shall be installed over a prepared seed bed," and "During the rainy season, October 15 to April 15, provide and maintain a straw-bale dike as per A.B.A.G. standard erosion & sediment control measures across the Beaconsfield Place right of way at the westerly limits of grading." (The DEIR recommends that earthwork and construction be in conformance with all of the erosion-control recommendations contained in the applicant's Alan Kropp & Associates geotechnical reports.)

V.

PROPOSED LANDSCAPING

Preparation of the DEIR did not involve review of a project landscaping plan. Existing project-site vegetation is described in the DEIR on pages 55-58. Visual characteristics of the project site and proposed development, including consideration of vegetation, are described and illustrated in the DEIR on pages 59-72. The Vegetation/Wildlife and Visual Characteristics sub-section (pp. 81-83) of the Environmental Impact Analysis section addresses vegetation impacts and provides mitigation-measure recommendations regarding existing vegetation, vegetation which would be removed with development, and the preparation of a landscaping plan.

The proposed project landscaping plan, provided in response to the City's requirement for additional environmental-review information, was drawn on two 30" x 36" sheets showing the east and west halves of the project site, at a scale of 1" = 10'. In order to accommodate these plans in this addendum, each plan sheet has been photographically reduced to an approximate scale of 1" = 25', and the reduced plans are presented as Figures 5-A and 5-B. Because this level of reduction makes it difficult to read the plan notes, the notes and plan legend are provided at a readable scale on page 13. (Prints of the full-scale plans are available for public review at the City of Oakland's Planning Department office.) The submitted landscaping plans contained in this addendum provide the following information:

Extent of Landscaping Area. The extent of proposed landscaping includes front-yard areas between the curbs and the fronts of houses, minor portions of side-yard areas, and, for houses below the proposed crib-walls, back-yard planting at the bases and tops of the walls. Landscaping in side-yard areas would be left to property owners. The landscaping plan proposes hydroseeding of all areas which are not proposed to be landscaped but which would be exposed by earthwork. Exposed areas would include side yards, roadside fill areas along the fronts of the three lots which are not proposed for development, the northeasterly creek-fill area, and rear-yard areas below crib walls, which would not be landscaped.

Species, Plant Sizes, and Locations

Street Trees. Proposed street trees are located at uniform distances behind the curbs, at generally-uniform intervals along both sides of the street.

SUGGESTED PLANT LIST

STREET TREES



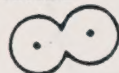
Fraxinus oxycarpa 'Raywood'
Liquidambar styraciflua
Quercus agrifolia
Platanus acerifolia
Pistacia chinensis

ACCENT TREES



Betula alba
Ginkgo biloba
Magnolia grandiflora 'Samuel Sommers'
Pyrus calleryana 'Bradford'
Prunus serrulata

LARGE/ MEDIUM SHRUBS



Nerium oleander
Heteromeles arbutifolia
Photinia fraserii
Ceanothus fraserii
Ceanothus sp.

MEDIUM /SMALL SHRUBS



Nandina domestica
Euonymus japonica 'Silver Queen'
Raphiolepis ballerina
Hebe 'Co-ed'
Pittosporum tobira 'Wheeler's Dwarf'
Camellia japonica

GROUND COVER



Coprosma kirkii
Arctostaphylos Point Reyes
Cotoneaster lowfast
Acacia redolens
Hedera helix 'Hanns'
Fragaria chiloensis
Laurentia fluvialis

SOD LAWN



Pacific Sod 'Medallion'

PLANTING:

Trees: Mixture of 24" box specimens and 15 gallon container stock.
Shrubs: Mixture of 5 gallon and 1 gallon container stock.
Groundcover: From 1 gallon container stock or from rooted cuttings.
Lawn: Pacific Sod 'Medallion', or 'Centennial'
Irrigation: Fully automatic irrigation system with controller, low gallonage heads and drip where appropriate
Hydroseeded: See mixture for hydroseeding, see notes for erosion control planting.

HYDROSEEDING AREAS

FOR GRADED SLOPES AND SLOPES GREATER THAN 2 TO 1 (IF GREATER THAN 2 TO 1 APPLY JUTE NETTING PER MFG. INSTRUCTIONS)

NOTE: ALL QUANTITIES ARE IN POUNDS PER ACRE

8 lbs Erigeron parvifolium
5 lbs Baccharis pilularis
5 lbs Lupinus arboreus
2 lbs Cistus villosus
2 lbs Mimulus aurantiacus
12 lbs Vulpia megalura 'Zorro'
6 lbs Rose clover (Inoculated)

GENERAL NOTES:

EROSION CONTROL PLANTING

All disturbed slopes and slopes greater than 2 to 1 are to be hydroseeded. Slopes greater than 2 to 1 are to receive jute mesh.

PLANT MATERIAL

Trees are to be a mixture of 15 gallon container and 24" box specimens, as indicated on the plan. Shrubs are to be a mixture of 5 gallon and 1 gallon containers. Ground cover from 1 gallon container stock at 5 feet on center or from rooted cuttings, developer's choice.

IRRIGATION

Irrigation system is to be both permanent and temporary. The temporary system is to be in use for a period of three years and abandon after this period.

SUPPORTIVE CARE PROCEDURES FOR EXISTING OAK TREES.

1. A certified tree expert shall supervise grading near trees to insure that any roots encountered shall be cut cleanly and sealed properly, and to insure that not regrading of soil occurs within 6 feet of tree.
2. The tree expert shall be provided by the owner. The tree expert shall have the authorization to direct proper grading near roots and shall make recommendations on root care during construction.
3. The absolute minimum area of protection for each existing oak tree is the drip line of the tree canopy.
4. Any construction to take place within the drip line area will require the following measures prior to commencing construction:
 - a. Carefully trench along the absolute minimum area needed for proposed construction, exposing the affected tree roots to the required trench depth.
 - b. IMPORTANT: Clean cut (Do Not Tear) affected roots and remove cut sections as desired.
5. During time of construction, do not store supplies or materials of any kind within the drip line so as to minimize soil compaction and chemical contamination of the tree.

PLANTING NOTES

1. Stake all trees with a 2" diameter lodgepole stake and 2 rubber and wire ties.
2. Supply agriform tablets as follows: 2-1 gallon cans, 3-5 gallon cans, 5-15 gallon cans
3. Rip existing soil to a depth of 4" prior to spreading soil amendment at 5 yards per 1,000 sq. ft. (soil amendment shall be cede soil or approved equal).
4. All planting areas shall be irrigated with an automatic system 100% coverage. Install system as per all local and county codes.
5. Dig planting pits 2 times the height and width of rootball. Backfill pits with 1/3 soil conditioner and 2/3 existing soil.
6. Any changes in plant material selection due to availability shall be approved by owner or owner's representative.
7. All planting areas to receive 2" of 1/2" diameter to dust fir bark mulch.
8. When landscaping in existing planted areas, contractor shall take care not to damage or destroy any existing plant material. Existing plant material that is damaged shall be replaced by the contractor at his expense.
9. Contractor shall use extreme care not to damage existing irrigation system when digging planting pits. Existing irrigation system that is damaged shall be replaced by the contractor at his expense.

NOTES AND LEGEND FROM SECOND SHEET OF PRELIMINARY LANDSCAPE PLAN, Addendum Figure 5-B

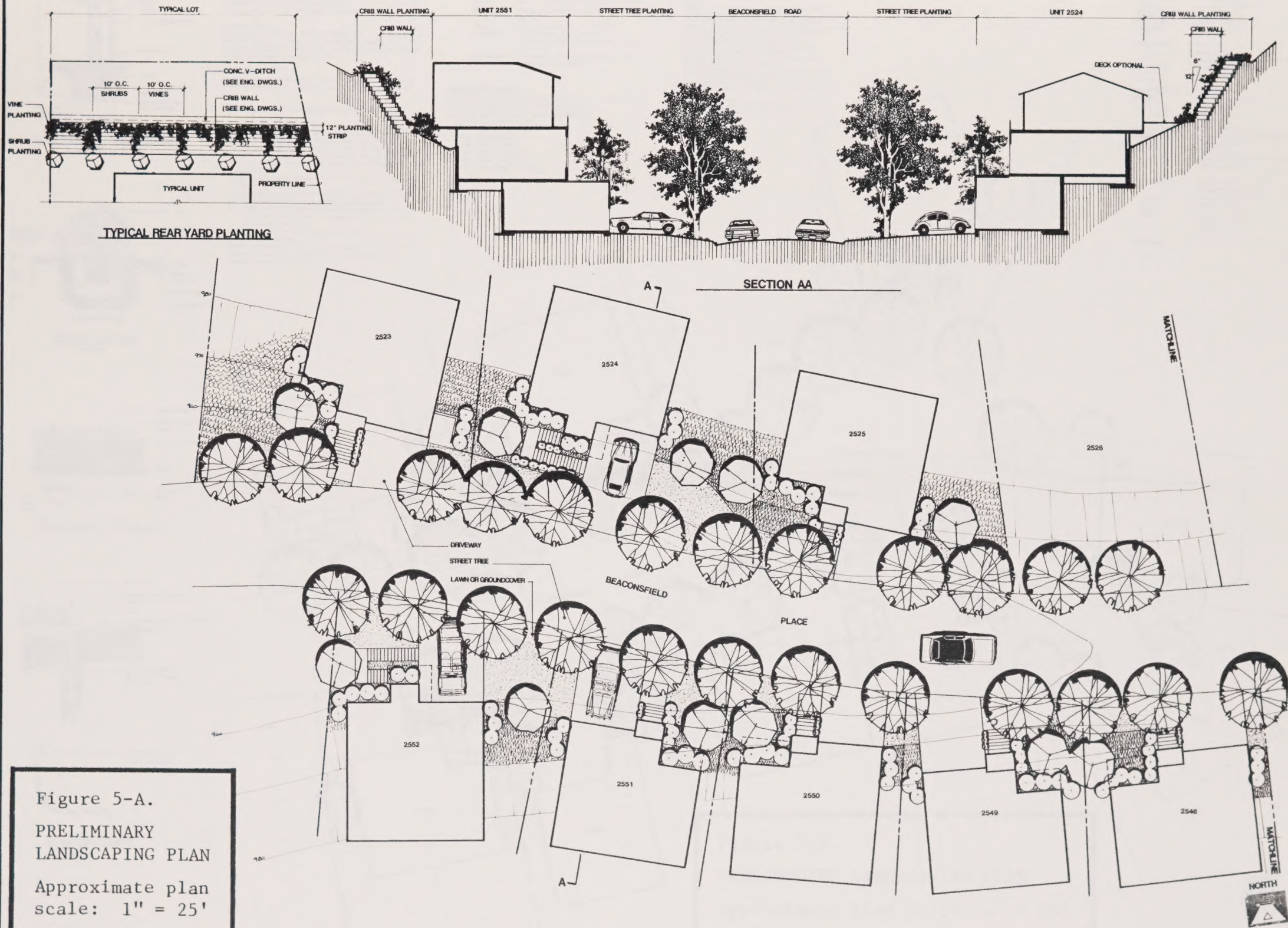
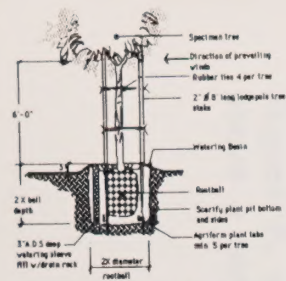
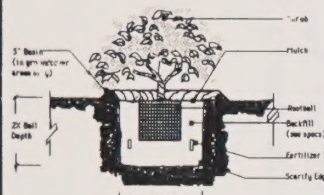


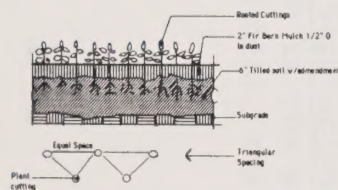
Figure 5-A.
PRELIMINARY
LANDSCAPING PLAN
Approximate plan
scale: 1" = 25'



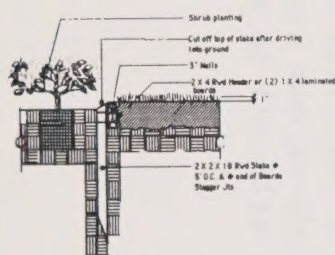
Tree Staking and Planting
Not to Scale



Shrub Planting
Not to Scale



Groundcover Planting
Not to Scale



Redwood Header
Not to Scale

GENERAL NOTES:

EROSION CONTROL PLANTING

All disturbed slopes and slopes greater than 2 to 1 are to be hydroseeded. Slopes greater than 2 to 1 are to receive jute mesh.

PLANT MATERIAL

Trees are to be a mixture of 15 gallon container and 24" box specimens, as indicated on the plan. Shrubs are to be a mixture of 5 gallon and 1 gallon containers. Ground cover from 1 gallon container stock at 5 feet on center or from rooted cuttings, developer's choice.

IRRIGATION

Irrigation system is to be both permanent and temporary. The temporary system is to be in use for a period of three years and abandon after this period.

SUPPORTIVE CARE PROCEDURES FOR EXISTING OAK TREES

- A certified tree expert shall supervise grading near trees to insure that any roots encountered shall be cut cleanly and sealed properly. Aid to insure that no regaining of soil occurs within 6 feet of tree.
- The tree expert shall be provided by the owner. The tree expert shall have the authorization to direct proper grading near roots and shall make recommendations on root care during construction.
- The absolute minimum area of protection for each existing oak tree is the drip line of the tree canopy.
- Any construction to take place within the drip line area will require the following measures prior to commencing construction:
 - Carefully trench along the absolute minimum area needed for proposed construction, exposing the affected tree roots to the required trench depth.
 - IMPORTANT: Clean cut (Do Not Tear) affected roots and remove cut sections as desired.
- During time of construction, do not store supplies or materials of any kind within the drip line so as to minimize soil compaction and chemical contamination of the tree.

PLANTING:

Trees

Mixture of 24" box specimens and 15 gallon container stock

Shrubs

Mixture of 5 gallon and 1 gallon container stock

Groundcover

From 1 gallon container stock or from rooted cuttings

Lawn

Pacific Sod Medallion, or Centennial

Irrigation

Fully automatic irrigation system with controller, low gallonage heads and drip where appropriate

Hydroseeded

See mixture for hydroseeding, see notes for erosion control planting.

HYDROSEEDING AREAS

FOR GRADED SLOPES AND SLOPES GREATER THAN 2 TO 1 IF GREATER THAN 2 TO 1, APPLY JUTE NETTING PER THE INSTRUCTIONS

NOTE: ALL QUANTITIES ARE IN POUNDS PER ACRE

- 8 lbs. Erigeron parviflorus
- 5 lbs. Baccharis pilularis
- 5 lbs. Lupinus arboreus
- 2 lbs. Cistus villosus
- 2 lbs. Mimulus aurantiacus
- 12 lbs. Vulpia megalura Torro
- 6 lbs. Rose clover (monoculture)

PLANTING NOTES

- Stake all trees with 6.25" diameter saplings and 2 rubber and wire ties.
- Supply Agriplan stakes as follows: 2" x 1 gallon cans, 3" x 5 gallon cans, 4" x 15 gallon cans.
- Preexisting soil to a depth of 4" prior to spreading soil amendment at 2" per sq. ft. (2000 sq. ft.) Soil amendment shall be added and approved soil.
- All planting areas shall be irrigated with an automatic system. 100% coverage install system as per all local and county codes.
- Dig planting pits 2 times the height and width of rootball. Back fill pits with 1/3 soil conditioner and 2/3 existing soil.
- Any changes in plant material selection due to availability shall be approved by owner or owner's representative.
- All planting areas for trees 2" to 4" diameter to be dug for 18" deep. When backfilling in existing planted areas, contractor shall have care not to damage or destroy any existing plant material. Existing plant material that is damaged shall be replaced by the contractor at his expense.
- Contractor shall use a minimum of 2" to 4" diameter saplings for irrigation system when digging planting pits. Existing irrigation system shall be damaged shall be replaced by the contractor at his expense.

SUGGESTED PLANT LIST

STREET TREES



Fraxinus viridis Raywood
Liquidambar styraciflua
Quercus agrifolia
Platanus acerifolia
Pistacia chinensis

ACCENT TREES



Betula alba
Ginkgo biloba
Magnolia grandiflora Samuel Sommers
Pyrus calleryana Bradford
Prunus serrulata

LARGE / MEDIUM SHRUBS



Nerium oleander
Heteromeles arbutifolia
Eucalyptus laevis
Ceanothus fraseri
Ceanothus sp.

MEDIUM / SMALL SHRUBS



Hamamelis domestica
Eubonymia japonica Silver Queen
Raphanistrum baltica
Hedera cordata
Philadelphus tomentosus
Camellia japonica

GROUND COVER



Cuscuta kirkii
Antirrhinum montanum
Cotoneaster lucidus
Asplenium platyneuron
Hedera helix
Fragaria chiloensis
Lauderbachia floribunda

SOD LAWN



Pacific Sod Medallion

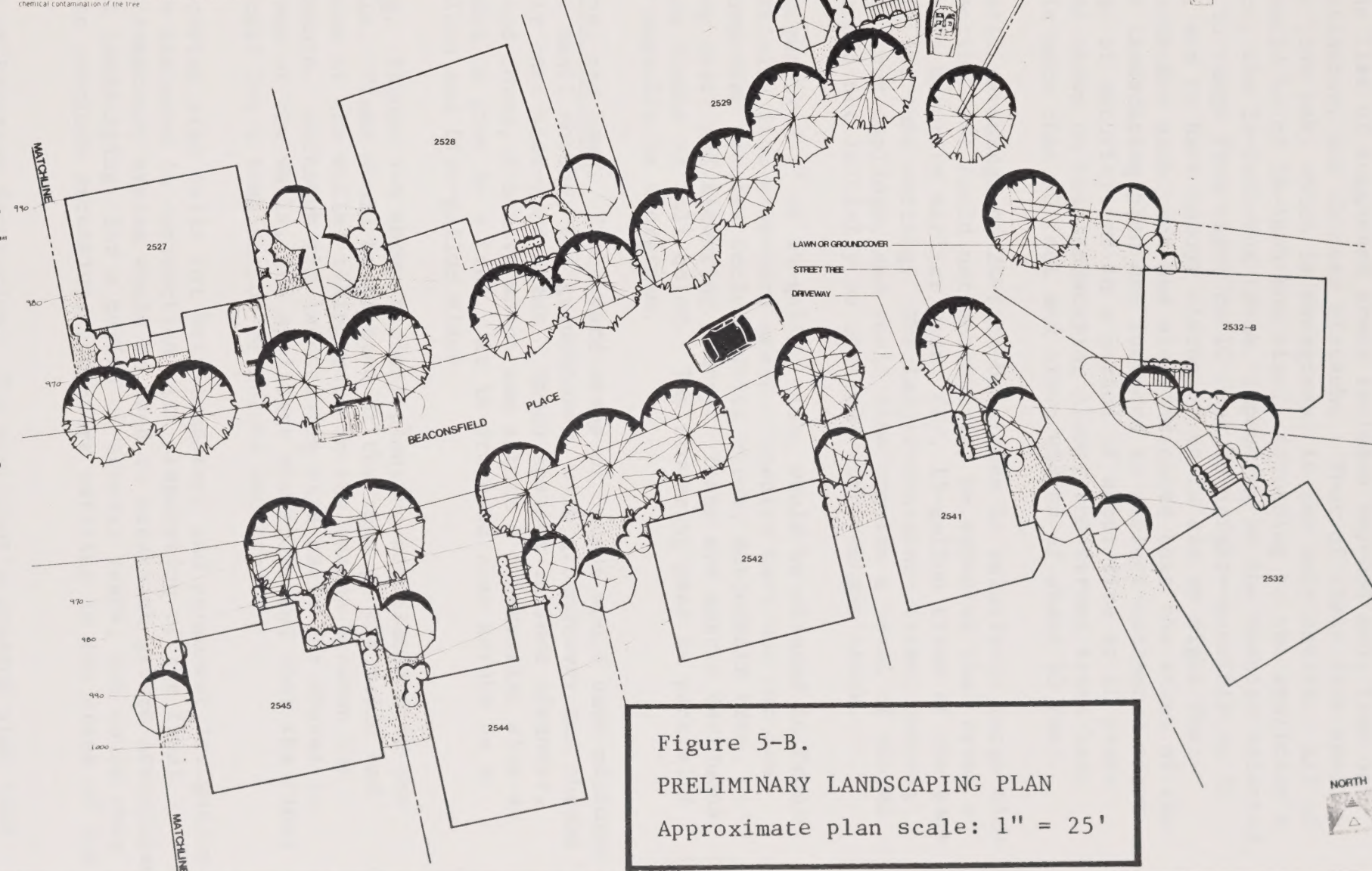


Figure 5-B.
PRELIMINARY LANDSCAPING PLAN
Approximate plan scale: 1" = 25'

Because the landscaping plan is preliminary, specific species have not yet been selected. The list of suggested trees includes Raywood ash, live oak, London plane, liquidambar, and Chinese pistache. Four of these five species are deciduous; the live oak, which is evergreen, is the only native. All of the street trees would be of 24-inch-box size. According to the applicant's landscape architect, the 24-inch-box trees, depending on the species selected, would be expected to range from eight to 10 feet in height--possibly up to 12 feet in height, and to have canopy widths of up to six or eight feet. The applicant's landscape architect has also indicated that the sizes of the trees shown on the landscaping plan are intended to reflect estimated sizes at about two-thirds of maturity, or in a period of about five or 10 years after planting. As shown on the landscaping plans, the street trees have heights of a little more than 30 feet and crown widths of about 20 feet.

The primary aesthetic advantage of 24-inch-box trees is relatively large size at the time of planting. It could not necessarily be expected that trees of this size would reach maturity earlier than, say, 15-gallon trees of the same species, planted in the same setting. The larger-container trees, however, would be real trees, not saplings, and would thus provide a level of visual prominence which could not initially be obtained with younger stock.

Accent Trees. "Accent trees," of 15-gallon size, would be planted in front-yard areas and partially into side-yard areas. Species have not yet been selected, but recommended species include white birch, maidenhair tree, magnolia, flowering pear, and flowering cherry. These are mostly deciduous trees, with varying shades of fall color. The flowering pear is partially deciduous and the magnolia is evergreen.

Groundcover, Shrubs, and Lawn. Front-yard areas of houses would have mixtures of lawn, large and small shrubs, and groundcover, with groundcover and shrubs extending partially into side-yard areas. Shrub species include oleander, heavenly bamboo, and toyon, a native which can attain a substantial size as a shrub or be pruned to grow as a tree. It is proposed that shrubs be a mixture of one-gallon and five-gallon sizes.

Retaining-Wall Planting. Figure 5-A shows typical planting associated with the proposed retaining walls. Vines would be planted at the tops of the walls and could grow down the faces of the walls, taking root in the spaces between the concrete crib-wall elements. Although the landscaping plan calls for shrubs to be planted at the bottoms of the walls, the applicant has indicated that the final landscaping plan will call for a combination of shrubs and trees.

Irrigation. The landscaping plan calls for both temporary and permanent irrigation systems, which would be designed in conjunction with preparation of the final landscaping plan. The temporary system would be used to establish growth associated with the retaining-wall landscaping, for a period of several years, and would then be abandoned in order to preclude excessive, long-term watering in the areas of the walls.

Removal and Protection of Existing Vegetation. The applicant's grading plan (and Figure 5, page 7, of the DEIR, which is the same base map as the grading plan) shows a number of trees within, and near, the areas of the site where earthwork

and construction would occur. These include scattered pines at the northwest corner of the site, which would be removed from the area below the proposed northside retaining wall; a 28-inch oak, which would be preserved, located on Lot 2546, just above the proposed southside retaining wall; several cypress trees which would be removed from the lower reach of the swale which enters the site from the southeast; and a few cypress and cottonwood trees, some of which might be removed to accommodate grading, located on Lots 2530 and 2531, along the creek which enters the northeast corner of the site. Submitted plans do not include information regarding trees above the proposed northside retaining wall, which might be impacted by construction of the wall; trees in a mixed-species grove located on, or along the west boundary of, Lot 2552, on the south side of the street at the west site boundary; or trees of various species and sizes, located at the east end of the site--other than those plotted on previously-submitted plans, which may be impacted by grading and construction in the areas of the northeasterly creek, the southeasterly swale, and the cypress grove at the end of street right-of-way.

The DEIR recommended that landscape planning include consideration of existing vegetation throughout the site, which might be impacted by the proposed development, and the City has indicated that the project landscaping plan should show existing vegetation across the site and vegetation proposed to be removed with development (see letter dated September 19, 1989, from the City to the applicant, contained in Appendix A). The preliminary grading and landscaping plans addressed in this addendum do not include existing vegetation (other than the trees, described above, which are shown on the original site-plan base map and are included on the grading plan).

Notations on the preliminary grading plan (see notes on page 13) do call for a tree expert to oversee the protection and preservation of existing oak trees during grading operations.

VI.

ENVIRONMENTAL IMPACT ANALYSIS

In light of the information provided by the applicant's preliminary grading/drainage plan and preliminary landscaping plan, as presented and discussed in this addendum, the Impact/Mitigation discussions presented in the DEIR, with regard to the sections entitled Geology, Soils, and Grading; Drainage; and Vegetation/Wildlife and Visual Characteristics (DEIR, pp. 78-83) are modified as indicated below. (Original wording as presented in the DEIR is in *Italic type*; omitted words are eliminated with dashed lines; additional wording is in Roman type; impacts and mitigation measures are numbered and lettered in conformance with numbering and lettering in the DEIR.)

C. GEOLOGY, SOILS, AND GRADING

1- Grading-Plan

Impact: *The applicant has not submitted a standard grading plan of the type which is normally required for new subdivisions. Instead, a number of separate plan sheets, including sample cross sections, plan views, and a plan/profile set, show the general*

grading concept in terms of retaining wall locations and roadway fill. No information is presented for sideyards or for lots which would not require retaining walls, and there are no details regarding earthwork around the roadway entrance to the site and the effect it would have on the existing house at 2639 Beaconsfield Place, located on the south side of the street, adjacent to the west boundary of the project site.

Mitigation. Although the project is not a new subdivision, its development will be equivalent to that of a new subdivision. The grading plan should be consistent with all subdivision grading-plan requirements of the City of Oakland, and should be reviewed by the applicant's geotechnical engineer, to provide assurance that proposed earthwork is consistent with the recommendations of the applicant's Alan Kropp & Associates 1988 and 1989 geotechnical reports. Grading for Lots 2526 through 2532-B should avoid cut slopes at the rear of the lots unless specifically approved by the geotechnical consultant. The grading plan should include details of earthwork in areas abutting the existing developed lot at 2639 Beaconsfield Place, to assure that this lot will not be disrupted during project grading. If project earthwork would involve this off-site lot, it is the responsibility of the applicant to obtain rights of construction entry from the lot owner and to arrange for repairs and clean-up as required.

2. Earthwork and Retaining Walls

Impact. To generate fill material, excavation is proposed along the lower areas of steep slopes which show evidence of active mass wasting (erosion, soil slippage, and sloughing). This poses the potential for reducing the stability of a broad, upslope area. The proposed solution is to construct tiered wood walls, up to six feet in height, at the rear of cut areas. (The applicant has also indicated interest in construction of Earthstone walls if there is objection to wood walls. Earthstone is a wall system involving a concrete facing element that has been successfully used to control surface raveling in areas of generally competent rock, where near vertical slopes are required. Sample commercial literature regarding the Earthstone system is contained in Appendix F.) The proposed solution is to construct concrete-crib retaining walls, generally ranging up to about 12 feet in height.

The potential problem with a wood wall is its longevity. Eventually, wood will rot and need to be replaced. Moreover, if the wood is allowed to be damp, especially if pressure-treated wood is nicked or gouged, or if interior wood is exposed by cutting boards to new lengths, the rate of decomposition would be unacceptable. It should also be recognized that the project's limited sideyard areas and steep sideyard slopes would make wall repair or replacement difficult, especially after long-term establishment of landscaping and improvements such as small, individual walls, stairways, etc.

The slope behind the proposed walls is steep (50% or greater) and up to 50 feet high, typically. The Alan Kropp & Associates borehole data indicate that the material to be retained consists of soil and rock that is severely weathered and fractured. Also, property owners may wish to establish ornamental plants in the areas of the walls, and regular irrigation of such landscaping could have an adverse effect on the life-of-the-wood. subsurface conditions in the areas of the walls.

Mitigation. Permanent walls (concrete) are preferable to wood walls. Field conditions are such that Earthstone is not an appropriate alternative.

It is recommended that wood posts be avoided, whatever the design of the wall. Instead, concrete columns that are imbedded well into competent rock and heavily reinforced with rebar are suggested. The spacing of posts, depth of concrete piers, and diameter and number of steel rebars should take into account the adverse geologic conditions. The design should also carefully take into account the type and lengths of lagging. Concrete lagging is preferable to wood boards. However, if pressure-treated wood is used, and if the lagging comes in eight-foot lengths, the spacing of columns should be four feet, not five feet, so that lagging boards are butted behind posts and there will be no need to expose interior wood by cutting boards to new lengths. If wood is used as lagging, imported drain rock will be required.

Even minor errors in the design and construction of the walls could result in long-term stability or maintenance problems. One such omission could be sufficient to reduce the long-term safety of the walls and slope area above. It is crucial that the grading code be carefully implemented, that the wall not be under-designed, and that all grading procedures be accurately documented to ensure the highest quality of performance. The geotechnical and structural engineers' calculations for the wall should be critically reviewed by the City.

The grading permit should specify that the applicant will submit a grading-completion report that will contain a detailed, as-graded plan, signed by the geotechnical engineer and engineering geologist. This plan should show stratigraphic units, aquifers, and bedding and joint planes. It should also include all subdrains and their connections, surveyed and mapped by the civil engineer.

The City should also consider retaining a geotechnical engineer and/or engineering geologist to monitor excavation and filling operations, to review any design modifications proposed during grading, and to review as-built plans and reports. (Several jurisdictions currently require monitoring of this type for projects in sensitive areas.)

The grading plan should be consistent with all subdivision grading-plan requirements of the City of Oakland, and should be reviewed by the applicant's geotechnical engineer, to provide assurance that proposed earthwork is consistent with the recommendations of the applicant's Alan Kropp & Associates 1988 and 1989 geotechnical reports. Grading for Lots 2526 through 2532-B should avoid cut slopes at the rear of the lots unless specifically approved by the geotechnical consultant.

The project geotechnical consultant(s), acceptable to the City, should be the project design-team member(s) directly responsible for providing assurance to the City that all design, monitoring, and implementation of earthwork, retaining walls, and associated drainage facilities are consistent with conservative development practice and with the soil, geologic, and drainage characteristics of the site.

3. Surface Drainage and Irrigation

Impact. Landscape irrigation could significantly raise groundwater levels at the project site. Irrigation could subject slopes to the equivalent of the wetter climate conditions of the past, contributing to the destabilization of cut slopes. Landscape irrigation in the project residential areas could cause either shallow or deep-seated slope movement. (The applicant's Alan Kropp & Associates 1988 report's

borehole logs indicate subsurface moisture only in the area of the drain pipe along the site's canyon floor, which may be the result of leaks in the pipe. During field investigation, some ponding of water was noted at the lower reach of the drainage channel which enters the site from the northeast. This may be due to landscape-irrigation runoff accumulating in a poorly-drained area of the channel.) Alan Kropp & Associates has recommended lined drainage ditches at the upper property lines of the lots, behind the upper retaining walls, and at the rear foundation/retaining wall of each house, and has also recommended mid-slope drainage terraces on all slopes with 25 feet or greater height. Closed conduits have been recommended to convey runoff from roof gutters and graded slopes to adequate storm-drain facilities. The applicant's preliminary grading/drainage plan calls for most of these facilities, but does not show lined ditches along the upper property lines or drainage terraces on the 30-40 foot, 2:1 graded slopes below the proposed retaining walls.

Mitigation.

- a- Alan Kropp & Associates has recommended lined drainage ditches at the upper property lines of the lots, behind the upper retaining walls, and at the rear foundation/retaining wall of each house, and has also recommended mid-slope drainage terraces on all slopes with 25 feet or greater height. Closed conduits have been recommended to convey runoff from roof gutters and graded slopes to adequate storm-drain facilities.
- b- All graded slopes should have either brow ditches or berms along their crests, to control surface runoff. These drainage structures should be underlain by subdrains.
- a. The applicant's geotechnical consultant should review the preliminary grading/drainage plan and prepare a written report regarding the possible need for drainage terraces on the cut-slope side yards below the proposed retaining walls and the possible need for lined ditches at the upper property lines of the lots, including consideration of the need for brow ditches or berms at the crests of graded slopes.
- b. c- Landscaping of lots should emphasize native, drought-tolerant species, to limit the need for irrigation. The project landscape architect should work with the Water Conservation Office of EBMUD to develop plans for installation and maintenance of water-conserving species.
- c. d- All slope and drainage ditches should be maintained by the property owners in accordance with a scheduled-maintenance plan prepared by a registered civil engineer and approved by the City. This plan should be provided to the property owners along with the documents they would routinely receive at the time of purchase. (Alternatively, if a homeowner association is formed, the scheduled-maintenance plan could be made part of the association's required maintenance obligations.)

D. DRAINAGE

1. Secondary Drainage System

Impact: The project submittal does not include complete plans for a secondary drainage system which will be needed to assure that runoff from residential lots is adequately collected and conveyed to the proposed roadway storm-drain system.

Mitigation: Provide a complete drainage-system plan consistent with the recommendations of the applicant's geotechnical study by Alan Kropp & Associates and in conformance with the subdivision ordinance and other regulations of the City of Oakland. Runoff collected from the rear yards of lots and from roof gutters should be conveyed in a closed system to the proposed roadway storm drain, or, if necessary, to an auxiliary roadway storm drain, rather than being directed to street gutters. (Recommendations from the Alan Kropp & Associates study are contained in Appendix F.)

1. Lot, Retaining Wall, and Street-Gutter Drainage

Impact. The preliminary grading/drainage plan appears to indicate that runoff from the site's slopes, which would be collected and conveyed to a series of drains along the residential-lot property lines, would be discharged into the street gutters, through three-inch pipes set through the curbs. If this is what is intended, then it means that that essentially all runoff from the site's slopes would be directed to the street. Also, the drainage plans do not show facilities for collecting gutter flow and conveying it to either the proposed storm drain under the project street or to the existing off-site storm drain to the west, under Beaconsfield Place.

Mitigation. During the Public Works review of the preliminary drainage plan, the City should carefully consider possible problems associated with the discharge of concentrated runoff from the site's slopes into the street gutters. Ideally, this runoff would be conveyed to a storm drain under the street. Also, the drainage plans should include catch basins on both sides of the west end of the project street, to collect gutter flow and convey it to the roadway storm drain, rather than allowing it to flow out of the ends of the gutters and onto Beaconsfield Place west of the site. (Such facilities are shown on the rough preliminary drainage plan on page H-4 of Appendix H, in the DEIR.)

2. Maintenance of Private, Common Drainage Facilities

Impact. Because of the combination of steep project-site slopes and the proposed provision of common, privately-owned drainage facilities, the City must be assured that project residents will act collectively to provide long-term drainage-system maintenance and repairs in order to preclude runoff-related geologic and property-damage problems.

Mitigation. In conjunction with submittal of final project plans, the applicant should propose a system for assuring long-term maintenance of common drainage facilities associated with the proposed retaining walls, and any other common facilities, to be permanently binding on project property owners.

3. Trash Rack Racks at Proposed Storm Drain Headwall Headwalls

Impact. The proposed storm-drain ~~headwall~~ headwalls at the northeast corner of the project site (~~Fig. 67 p. 8~~) and in the swale at the southeast corner of the site (Addendum Figures 4-B and 4-C) could become obstructed by debris washed down the ~~creek channel~~ drainage channels, possibly resulting in overflow and damage to downstream improvements.

Mitigation. Final drainage-system plans should include a ~~trash rack~~ trash racks (~~debris-catcher~~) (debris catchers) designed in accordance with City requirements.

E. VEGETATION/WILDLIFE and VISUAL CHARACTERISTICS

Note. In the DEIR, impacts and mitigation measures regarding existing project-site vegetation and project landscaping are included in the Vegetation/Wildlife and Visual Characteristics sub-section of the Environmental Analysis section, on pages 82 and 83. In response to the preliminary landscaping plan which is presented and discussed in this addendum, no changes are proposed in the impact/mitigation text on pages 82 and 83 of the DEIR, except for the addition of the following mitigation measure, which is added to the list of mitigation measures on page 83:

- g. Preparation of the landscaping plan should involve careful consideration of the treatment of steep side- and rear-yard cut slopes. Drip irrigation should be used on steep slopes and for landscaping associated with retaining walls, to avoid overwatering. Species used for hydroseeding slopes should combine the qualities of soil retention, drought tolerance, fire retardance, and light weight.

CITY OF OAKLAND



CITY HALL • ONE CITY HALL PLAZA • OAKLAND, CALIFORNIA 94612

Planning Department

TTY 839-6451

September 19, 1989

ARTEK, INC.
Attn: Edward Patmont
2231-A Commerce Avenue
Concord, CA 94520

RE: Confirmation of Final Procedural Tasks for Beaconsfield
Homes Draft Environmental Impact Report (DEIR)

Dear Mr. Patmont:

This letter serves to confirm the direction and tasks indicated as per your telephone conversation with me and Elois A. Thornton of my staff, relating to further processing of the Beaconsfield Homes DEIR.

At the September 6 City Planning Commission meeting, we asked that the public hearing on the DEIR be reopened to allow further opportunity for evaluation and public comment on the proposed grading plan, landscape plan, and secondary drainage plan for your proposal. Accordingly, a public hearing before the Commission has been scheduled for October 18, 1989. Because we would like the EIR consultant's evaluation of these plans to be available for distribution two weeks before the October 18 hearing, it is imperative that you get these materials to him for evaluation as soon as possible. We understand that preparation of these plans is currently underway.

With reference to the specific contents of the grading, and secondary drainage plans, we recommend you consult, if you have not already done so, with the City's Office of Public Works. These plans should specifically indicate actions proposed for the drainage swale located on the southeast area of the subject site, as interest in this area has been evidenced in a submitted public comment on the DEIR. The landscape plan should show the type, location and extent of all vegetation both presently on the site, as well as that to be removed for siting the proposed homes and street.

The sequence of events relating to final processing of the DEIR are as follows:

STEP	DATE	PROCEDURE
1	By Thursday, October 5, 1989	EIR consultant submits 100 copies of the Addendum to the DEIR to Planning Department staff
2	Friday, October 6	Addendum distributed to interested parties for review
3	Wednesday, October 18	Commission hearing held on the Addendum; and upon receipt of comments, hearing closed
4	Thursday, October 19	Comments on the Addendum (and on original DEIR) forwarded to EIR consultant for preparation of responses to comments
5	Friday, November 17 (Tentative)	EIR consultant submits 100 copies of the Final EIR (which consists of the original DEIR, the Addendum, and responses to comments on the two) to Planning Department staff
6	Wednesday, November 22 (Tentative)	FEIR distributed to interested parties for certification at the November 29 Commission meeting
7	Wednesday, November 29 (Tentative)	FEIR certified

A copy of the letter will be sent to your EIR consultant to ensure understanding among all appropriate parties. Please secure whatever contractual arrangements between you and your consultant as are necessary to facilitate this sequence of events.

If you foresee any problems with the above scheduling, or have further questions, please contact Ms. Thornton at 273-3941.

Thank you.

Sincerely,

Alvin D. James
ALVIN D. JAMES
Director of City Planning

cc: Steven Billington
Joe Wong, OPW
ER88-11/TPM 5393
F-208 3BECNFD.EAT

A-1

EVALUATION AND CONCLUSIONS

From a geotechnical engineering standpoint, it is our opinion that the site is suitable for the proposed development. However, all of the conclusions and recommendations presented in this report should be incorporated in the design and construction of the project to avoid possible geotechnical problems. The primary considerations for geotechnical design at the site include the quantity of fill placement during the improvement of Beaconsfield Place and improvement of the storm water drain line in the roadway as well as the potential hazards related to sloughing of the surficial soils and future seismic shaking. Evaluations of these items, as well as discussions of other geotechnical aspects of the project, are presented below. Recommendations for geotechnical aspects of the development are presented in the next section of our report.

A. Building Sites

On Figure 2, we have shown the proposed lots and the associated building areas. Each of these sites is located in an area where competent, in-place bedrock is anticipated at a relatively shallow depth (less than about 10 feet). Based on the topographic and lithologic data, it is our opinion that the potential for long term stability of the proposed building sites is good. In addition, we understand that substantial cuts are to be made into the hillside in order to establish the lower house levels. These cutting operations will likely expose the competent bedrock leading to even greater future stability of the home sites.

B. Proposed Improvement of Beaconsfield Place

The proposed improvements to Beaconsfield Place will not appreciably change the alignment of the existing rough graded roadway. However, as shown on Figure 2, as much as 20 feet of fill will be placed in order to raise the grade of the roadway. Since this grade raising will partially fill this natural drainage it will be necessary to install a subdrainage system beneath the fill soils. This system will allow the groundwater which naturally collects in this drainage to drain away and minimize future problems.

C. Storm Water Drain Improvement

During our reconnaissance of the site we noted the poor condition of the existing storm water drain system. Because this site is located in an area that naturally collects and concentrates both surface and subsurface water, an experienced general civil engineer or hydrologist should be retained to develop plans for a new surface water collection system.

EVALUATION AND CONCLUSIONS, AND
RECOMMENDATIONS FROM APPLICANT'S
1988 GEOTECHNICAL STUDY

ALAN KROPP & ASSOCIATES

EVALUATION AND CONCLUSIONS (Continued)

D. Sloughing of Surficial Soils

The surficial soils on the slopes at the site are loose and quite weak. When the slopes on which these materials are located are oversteepened or become saturated sloughing can begin. At several locations on the property, shallow sloughing of the surficial soils can currently be seen. This problem is particularly evident along the southern slope which appears to have been oversteepened during the rough grading of the roadway. In order to minimize the amount of future sloughing, surface water on the slopes should be carefully controlled. In addition, surficial grading on the slopes outside the proposed house locations should be kept to a minimum.

E. Seismic Ground Shaking

Although research on earthquake prediction has greatly increased in recent years, seismologists have not yet reached the point where they can accurately predict when and where an earthquake will occur. Nevertheless, on the basis of current technology, as well as historical evidence, it is reasonable to assume that the proposed structures will be subjected to at least one moderate to severe earthquake that will cause strong to violent shaking of the site. Therefore, all structures must be designed to resist high lateral forces induced by such shaking. Further, the recommendations for site earthwork and drainage presented in the following section of the report should be carefully followed to minimize the potential for ground failure during seismic shaking.

ALAN KROPP & ASSOCIATES

RECOMMENDATIONS

A. Earthwork

A.1. Clearing and Site Preparation

The site should be cleared of all obstructions including designated trees, any underground utility lines, and debris. Holes resulting from the removal of trees and underground obstructions that extend below the proposed finish grade should be cleared and backfilled with suitable material compacted to the requirements given below under Item A.6., Compaction. We recommend that the removal of any major trees and the backfilling operations for these excavations be carried out under the observation of the soil engineer, so that all roots are removed and the excavations are properly backfilled.

After clearing, the portions of the site to be developed which contain surface vegetation or organic laden topsoil should be stripped to an appropriate depth to remove these materials. At the time of our field investigation, we estimated that a stripping depth of approximately 2 inches would be required. The amount of actual stripping should be determined in the field by the soil engineer at the time of construction. The cleared and stripped materials should be removed from the site or stockpiled for later use in landscaping if desired.

A.2. House Excavations

After the site is cleared and stripped, excavations for the homes can be made. We recommend that excavation work and construction of major retaining walls not be performed during the rainy winter months. As the excavation is made, temporary shoring should be used, as required, to prevent the movement of materials exposed in the face of the excavation. We recommend that the excavation and subsequent wall construction be continuous in order to minimize the length of time the temporary slope is exposed.

The excavated materials can be selectively stockpiled for backfill behind the wall. However, all excess materials derived from the excavation should be removed from the site. We recommend a representative of our firm be present as the excavation is made to determine if adverse geotechnical conditions are exposed. Based on our evaluation of the subsurface conditions and our experience with excavations for other buildings in similar subsurface materials, it is our opinion that excavation of these materials will be variable. The surficial soils and severely weathered bedrock can be easily excavated; however, areas of moderately weathered bedrock may be more difficult to excavate. Where difficult excavation is encountered, heavier equipment may be required.

A.3. Subgrade Preparation

After the site excavations are made, the exposed soils in those areas to receive structural fill, slabs-on-grade or pavements should be scarified to a depth of 6 inches, moisture conditioned to slightly above optimum water content and compacted to the requirements for structural fill.

RECOMMENDATIONS

A. Earthwork (Continued)

A.4. Material for Fill

All on-site soils below the stripped layer and having an organic content of less than 3 percent by volume can be used as fill except where non-expansive import is required beneath the slabs. However, all fill placed at the site, including on-site soils, should not contain rocks or lumps larger than 6 inches in greatest dimension with not more than 15 percent larger than 2.5 inches. In addition, the required import fill should be predominantly granular with a plasticity index of 12 or less.

A.5. Compaction

All structural fill less than 5 feet thick should be compacted to at least 90 percent relative compaction as determined by ASTM Test Designation D 1557-78, except for the upper 6 inches of subgrade soils under pavements which should be compacted to at least 95 percent relative compaction. Structural fill or wall backfill greater than 5 feet high should be compacted to at least 95 percent relative compaction. Fill material should be spread and compacted in lifts not exceeding 8 inches in uncompacted thickness. We should note that if construction proceeds during or immediately after the wet winter months, it may require time to dry the on-site soils to be used as fill since their moisture content will probably be appreciably above optimum.

A.6. Trench Backfill

Pipeline trenches should be backfilled with fill placed in lifts not exceeding 8 inches in uncompacted thickness. The following table presents our recommendations for compaction requirements.

Condition	Trench Depth (ft)	Compaction Requirements*	
		Native Soils	Granular Import Soils
Non-Improved Area	Any depth	85%	90%
Improved Area	Less than 5-feet	Upper 3-feet 90% Lower 2-feet 85%	Entire backfill 90%
	5-feet or greater but less than 8-feet	Entire backfill 90%	Entire backfill 95%
	8-feet or greater	Entire backfill 95%	Entire backfill 95%

*Assumes a reasonable "cushion" layer around the pipe.

RECOMMENDATIONS

A. Earthwork

A.6. Trench Backfill (Continued)

If imported granular soil is used, sufficient water should be added during the trench backfilling operations to prevent the soil from "bulking" during compaction. In all of the cases outlined above, we recommend that the upper 6-inches of subgrade under pavement and baserock be compacted to at least 95% relative compaction. All compaction operations should be performed by mechanical means only. We recommend against jetting unless the backfill material is granular (sand or gravel) and the water used in jetting is able to rapidly flow out of the trench.

If granular backfill is used for utility trenches, we recommend that an impermeable plug or mastic sealant be used where utilities enter buildings to minimize the potential for free water or moisture to enter below them. Finally, because of the potential for catastrophic collapse of trench walls we recommend that the contractor carefully evaluate the stability of all trenches and use temporary shoring where appropriate. The design and installation of the temporary shoring should be wholly the responsibility of the contractor. In addition, all state and local regulations governing safety around such excavations should be carefully followed.

A.7. Slopes

We recommend that all cut slopes in intact, moderately weathered bedrock have a maximum inclination of 1.75:1 (horizontal to vertical); cut slopes in severely weathered bedrock or soils and all fill slopes should not be steeper than 2:1. All cut slopes should be contour rounded to provide smooth transitions from one slope inclination to the next. The surface of all fill slopes should be either back-rolled, or compacted beyond the limits of the slope and cut back in order to achieve satisfactory compaction. We should not that this firm should be allowed to examine all cut slopes at the time of construction in order to determine the degree of weathering and make recommendations as to maximum slope inclination. For planning purposes, materials which lie within six feet of the existing ground surface should be considered to be soil or severely weathered bedrock which should have a maximum inclination of 2:1.

Any cut or fill slopes which are greater than 25 feet high, measured vertically, should contain horizontal drainage terraces at least 8 feet wide at intervals of no more than 25 feet vertically. When only one terrace is required, it should be located at mid-slope. We recommend that all cut slopes be evaluated in the field during construction to determine if any adverse geotechnical conditions are exposed.

A.8. Fill Placement on Slopes

Where fills are to be placed on existing slopes having inclinations steeper than 5:1, a base key should be excavated into competent materials at the toe of the new fill slope. The depth and extent of keys should be determined by the soil engineer in the field at the time of construction. However, all base keys should be at least 10 feet wide and should slope back into the hillside at a gradient of at least 2 percent.

RECOMMENDATIONS

A. Earthwork

A.8. Fill Placement on Slopes

In addition, if the fill slope is greater than 10 feet high, benches should be excavated in to the slope before placing the fill at vertical intervals of no more than 10 feet. These benches should be at least 10 feet wide. However, the actual dimensions of the benches should be determined by the soil engineer at the time of construction.

B. Drainage and Erosion Control

B.1. Roadway Subdrain

A subdrain should be constructed down the centerline of the valley, beneath the existing rough graded roadway. The approximate location of this subdrain is shown on Figure 2. The subdrain should consist of an 12-inch diameter, perforated pipe in a trench filled with open-graded rock which is wrapped in an approved, polyester, non-woven geotextile. The trench should be at least 24 inches wide, and should be extended into bedrock or to a depth of 4.0 feet, whichever is less. The pipe should be sloped at a minimum gradient of 3% and should outlet at the intersection of Beaconsfield Place and Keswick Court. The pipe should be placed in the trench with the perforations down on at least 4 inches of gravel bedding. In areas where fill is to be placed the gravel should be extended to the existing ground surface, in areas where no fill is planned the upper one foot of trench backfill should consist of compacted, on-site, relatively impermeable material.

B.2. Surface Gradients

Positive surface gradients should be provided in all areas of the development. All lots should be graded to provide for runoff of surface water and direct water away from buildings toward suitable discharge facilities. Ponding of surface water should not be allowed adjacent to the structures or on pavements. In areas that cannot be sloped to drain away from structures, yard drains should be provided to convey water down to the roadway. To minimize the potential for water ponding below structures, we recommend that a gradient of at least 5% be established extending a minimum of 5 feet away at right angles from all building. If patios are planned upslope of the residences, we recommend that they be paved to prevent erosion or weakening of the surface soil near the structure. The patio should be sloped to a central drain leading to suitable discharge facilities. Alternatively, if rear decks are planned, we recommend that the slope under the deck be covered with several inches of concrete similar to what is commonly used for rat-proofing. This rat-proofing should be sloped to drain away from the residences to suitable discharge facilities. The Landscape Architect on the project should be informed of this recommendation, and the grading contractor and landscape contractor on the job advised of this during construction.

B.3. Roof Water

Continuous gutters and downspouts leading to closed pipes should be provided at each structure; these pipes should transmit the water to an appropriate discharge facility.

RECOMMENDATIONS

B. Drainage and Erosion Control (Continued)

B.4. Water on Slopes

In order to help minimize the potential for saturation, weakening and subsequent sloughing of the surficial soils on the slopes at the site we recommend that v-ditches be constructed across the top boundaries of all the lots. These ditches should slope at a gradient of at least 2 percent to closed pipes which discharge onto the streets below.

B.5. Drainage of Fill Keys and Benches

The base key of all fill slopes greater than 10 feet high which are located on natural slopes should contain a perforated pipe to drain the key. In addition, it may also be necessary to construct drains at the base of benches below the new fill; however, a decision regarding the need for these drains should be made in the field at the time of construction.

B.6. Drainage of Slope Terraces

Horizontal drainage terraces on the surface of cut or fill slopes should be provided with paved "V" ditches. These ditches should slope at a gradient of at least 2 percent to an appropriate discharge facility.

B.7. Additional Drainage Measures

If areas are exposed during the grading operations which indicate sources of seepage or instability, additional drainage measures will be recommended by the soil engineer.

B.8. Erosion Control

Grading should be restricted to the dry season, and basins should be provided in padded areas (eg. cul-de-sac) to detain runoff and trap sediments. All graded areas should be protected from erosion by spraying a hydromulch with a tackifier on the slopes prior to the onset of winter rains. On slopes steeper than 3:1, we recommend that use of a slope protection fabric such as "North American Green C 125" or an equivalent approved in advance by this firm.

C. Structures

C.1. Footing Foundations

We recommend that in areas where intact bedrock has been exposed by cutting into the hillside that conventional, continuous and isolated spread footings be employed.

RECOMMENDATIONS

C. Structures

C.1. Footing Foundations (Continued)

All footings should extend at least 16 inches below the lowest adjacent finished grade. In addition, any footings located adjacent to utility trenches should also have their bearing surfaces below an imaginary 1:1 (horizontal to vertical) plane projected upward from the edge of the bottom of the adjacent trench.

At the above depths, the footings may be designed for an allowable bearing pressure of 2000 pounds per square foot due to dead loads, 3000 pounds per square foot due to dead plus live loads, and 4000 pounds per square foot for all loads, including wind or seismic. These allowable bearing pressures are net values; therefore, the weight of the footings can be neglected for design purposes. However, all footing should have a minimum width of 14 inches, and all continuous footings should be tied together with reinforcing steel, compacted to at least 90 percent relative compaction. We also recommend that any isolated footings or drilled piers on slopes steeper than 4:1 be tied together with tie-beams or grade beams that extend up and down the slope between the isolated footings and drilled piers, as well as across the slope.

Lateral load resistance for portions of the buildings or footings may be developed in friction between the bottom of the footing and the supporting bedrock. A friction coefficient of 0.40 is considered applicable. As an alternative, a passive resistance equal to an equivalent fluid weighing 350 pounds per cubic foot acting against the foundation may be used. If the foundations are poured neat against the rock, friction and passive resistance may be used in combination.

C.2. Pier and Grade Beam Foundations

We recommend that in areas where bedrock is not exposed at the ground surface that drilled, cast-in-place, straight-shaft piers that are designed to develop their load carrying capacity through friction between the sides of the piers and the surrounding subsurface materials be used. Friction piers should have a minimum diameter of 16 inches, and there should be at least a minimum center to center spacing of 2.5 times the shaft diameter between adjacent piers.

The piers should generally extend to a depth adequate to provide at least 8 feet of embedment into bedrock. Since bedrock was encountered at depths of 3 to 9 feet our borings in the building areas, the piers for the residences should generally extend to a minimum depth of about 11 to 17 feet below the existing ground surface. To determine whether these depths are adequate to carry the structural loads of the residences, allowable skin friction values of 800 pounds per square foot for dead plus live loads and 1200 pounds per square foot for all loads, including wind or seismic, can be used in the bedrock. These values can be used starting at the bedrock surface.

To minimize damage resulting from potential "creep" type movement, we recommend that all piers be designed to resist a uniform lateral pressure of 500 pounds per square foot acting against the projected diameter of the pier to a depth of 3 feet below the ground surface.

RECOMMENDATIONS

C. Structures

C.2. Pier and Grade Beam Foundations (Continued)

The bottom of pier excavations should be dry and reasonably free of loose cuttings and soil fall-in prior to installing reinforcing steel and placing concrete. Any accumulated water in pier excavations should be removed prior to placing reinforcing steel and concrete, or the concrete should be tremied to the bottom of the hole. Care should be taken during concrete placement to avoid "mushrooming" at the tops of the piers. Since the actual depths of the piers will have to be determined in the field, we recommend that the excavation of piers be performed under the observation of our firm to confirm that they are constructed in accordance with the recommendations presented herein.

The piers should be tied together with grade beams that extend up and down the slope between the piers, as well as across the slope between the piers. Maximum horizontal distance between the grade beams should be in the range of 20 feet. The grade beams should be designed to span between the piers in accordance with structural requirements. In order to minimize the possible detrimental effects of the expansive soils we recommend that either a 4-inch void be created at the bottom of all grade beams or the grade beam be designed to resist an uplift pressures of 2000 pounds per square foot. If a void is used, our firm should review and approve the method of forming the void prior to construction of the grade beams.

The floor system should be structurally supported and derive all of its support from the pier and grade beam foundation.

Lateral loads on the piers may be resisted by passive pressures acting against the sides of the piers. We recommend a passive pressure equal to an equivalent fluid weighing 400 pounds per square foot per foot of depth to a maximum value of 4000 pounds per square foot. This value can be assumed to be acting against $1\frac{1}{2}$ times the diameter of the individual pier shafts starting 3 feet below the bottom of grade beams.

C.3. Slabs-on-Grade

We recommend that slabs-on-grade for the garages be supported directly on undisturbed natural materials or compacted fill. However, if both soil and bedrock materials are exposed at subgrade level, the bedrock materials should be over-excavated by at least 6 inches and replaced with compacted fill materials. Prior to final construction of the slabs, the subgrade surface should be proof-rolled to provide a smooth, firm surface for slab support.

The slabs should be appropriately reinforced according to structural requirements; concentrated loads may require additional reinforcing. Minor movement of the concrete slab with resulting cracking should be expected. The recommendations presented above, if properly implemented, should help minimize the magnitude of this cracking.

In any slab area where minor floor wetness would be undesirable, 4 inches of free drainage gravel should be placed beneath the floor slab to serve as a capillary barrier between the subgrade material and the slab. An impermeable membrane should be placed over the gravel, and the membrane should be covered with 2 inches of sand to protect it during construction.

RECOMMENDATIONS

C. Structures

C.4. Retaining Walls

We recommend that restrained and unrestrained walls for cut slopes with a level surface or with a sloping surface flatter than 4:1 above the wall be designed to resist an equivalent fluid pressure of 50 and 35 pounds per cubic foot, respectively. Where the sloping surface above the wall is at a natural inclination of 1:1, restrained and unrestrained walls for cut slopes should be designed to resist an equivalent fluid pressure of 80 and 60 pounds per cubic foot, respectively. For walls with a sloping surface at an inclination between 4:1 and 1:1, a straight line interpolation between the indicated values may be used. The above pressures may be reduced by 5 pounds per cubic foot for the portions of the cut extended into bedrock. We recommend that restrained and unrestrained walls for fill slopes with a level surface or with a sloping surface flatter than 4:1 above the wall be designed to resist an equivalent fluid pressure of 60 and 40 pounds per cubic foot, respectively. Where the sloping surface is at an inclination of 2:1 restrained and unrestrained walls for fill slopes should be designed to resist an equivalent pressure of 80 and 60 pounds per cubic foot, respectively. If the designer determines that there are surcharge loads on the walls, the walls should be designed to resist an additional uniform pressure equivalent to one-half or one-third of the maximum anticipated surcharge load applied to the surface behind restrained or unrestrained walls, respectively.

The above pressures assume that sufficient drainage will be provided behind the walls to prevent the build-up of hydrostatic pressures from surface and subsurface water infiltration. Adequate drainage may be provided by a subdrain system consisting of a four-inch perforated hardened plastic pipe bedded in open-graded rock wrapped in an approved, polyester, non-woven geotextile. The permeable material placed behind the wall should be at least one foot in width and should extend to within one foot of finished grade. The upper one foot of backfill should consist of on-site, compacted, impervious soils. The subdrain pipe should be connected to a system of closed pipes that lead to a suitable discharge facility. Cleanouts should be provided at the upslope end of the perforated pipe and at the junction of the perforated and solid pipes.

Lined surface ditches should be provided behind all walls. These ditches which will collect runoff water from the slope, should be sloped to drain to catch basins leading to a solid pipe; the solid pipe should extend to a suitable discharge facility. The top of the walls should extend at least one foot above the ditches. All structural backfill placed behind the walls should be compacted to at least 90 percent relative compaction.

RECOMMENDATIONS (Continued)

D. Plan Review

We recommend that our firm be provided the opportunity for a general review of geotechnical aspects of the final plans and specifications for this project in order that the geotechnical recommendations may be properly interpreted and implemented in the design and specifications. Specific items that we recommend our firm review and that the plans should contain, include, but are not limited to, the following:

- 1) General: A citation of this foundation investigation report (in the general notes.)
- 2) Foundations: Pier dimensions and depth of embedment, as well as footing dimensions and depth.
- 3) Slabs: Depth of scarification required, import fill depth, baserock or drainrock depth, vapor barrier and sand, as required.
- 4) Retaining walls: Foundation requirements (as noted in Item 3 above), wall drain system, impermeable plug above drain, surface ditch and freeboard, as needed.
- 5) Drainage: Gradient away from structure, downspout collector pipes, surface or subdrain collector system, discharge location.

If our firm is not accorded the privilege of making the recommended review, we can assume no responsibility for misinterpretation of our recommendation.

E. Construction Observation

The analysis and recommendations submitted in this report are based in part upon the data obtained from the fifteen soil borings. The nature and extent of variations across the site may not become evident until construction. If variations then become apparent, it will be necessary to re-evaluate the recommendations of this report.

We recommend that our firm be retained to provide geotechnical engineering services during the earthwork, drainage, and foundation construction phases of the work. This is to observe compliance with the design concepts, specifications and recommendations and to allow design changes in the event that subsurface conditions differ from that anticipated prior to the start of construction.

We also recommend that a representative of our firm observe the following aspects of the construction:

- 1) Site clearing and stripping;
- 2) Placement and compaction of any engineered fill;
- 3) Subgrade scarification and recompaction;
- 4) Excavation for lower levels;

RECOMMENDATIONS

E. Construction Observation (Continued)

- 5) Excavation of footing trenches;
- 6) Drilling of straight shaft pier holes;
- 7) Construction of the roadway subdrain;
- 8) Placement of compaction of sewer, storm drain, and utility trench backfill;
- 9) Installation of drainage systems behind retaining walls;
- 10) Construction of surface v-ditches;
- 11) Construction of surface drainage measures, including the placement of downspouts into discharge conduits; and
- 12) Finished grading and landscape grading around the perimeters of the structures.

In order to effectively accomplish these observations we recommend that a pre-construction meeting be held to explain our recommendations to the contractor and develop a mechanism for proper communications throughout the project. We also request that the client or his representative (the contractor) contact our firm at least 48 hours prior to the commencement of any of the items listed above. If our representative makes a site visit in response to a request from the client or his representative and it turns out that the visit was not necessary, our charges for the visit will still be applied.

RECOMMENDATIONS (Continued)

F. Wet Weather Construction

Although it is possible that construction can proceed during or immediately following the wet winter months, a number of geotechnical problems may occur which may increase costs and cause project delays. The water content of on-site soils may increase during the winter and rise significantly above optimum moisture content for compaction of subgrade or backfill materials. If this occurs, the contractor may be unable to achieve the recommended levels of compaction without using special measures and would likely have to:

- 1) Wait until the materials dry enough to become workable;
- 2) Dispose of the wet soils and import dry soils; or
- 3) Use lime or cement on the native materials to absorb water and achieve workability.

If trenches or excavations are open during winter rains, then caving of the trench or excavation walls may occur. Also, if the trenches fill with water during construction or if saturated materials are encountered at the anticipated bottom of the trenches or excavation, the trenches may need to be extended to greater depths to reach adequate bearing than would be necessary if dry weather construction took place.

We should also note that it has been our experience that increased clean-up costs will occur, and greater safety hazards will exist if the work proceeds during the wet winter months.

G. Future Performance

All people who own or occupy homes on hillsides should realize that landslide movements are always a possibility, although generally the likelihood is very low that such an event will actually occur. The probability that landsliding will occur is substantially reduced by the proper maintenance of drainage measures at the site (see detailed discussion in Appendix A). Therefore, the homeowners should recognize their responsibility for performing such maintenance. Consequently, we recommend that a copy of our report be provided to any future homeowners of the property if the homes are sold.

Even if proper maintenance is performed, landsliding may still occur during very heavy rains, breaks in water lines, or other severe environmental conditions. As noted earlier, the likelihood of landsliding is very low, but because the consequences of such an event could be costly, we recommend that landslide insurance for the property be obtained.

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